

A taxonomic revision of *Beyeria* Miq. (Euphorbiaceae: *Ricinocarpeae*, *Ricinocarpinae*)

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Summary

Halford, D.A. & Henderson, R.J.F. (2008). A taxonomic revision of *Beyeria* Miq. (Euphorbiaceae: *Ricinocarpeae*, *Ricinocarpinae*). *Austrobaileya* 7(4): 577–639. The genus *Beyeria* Miq. is endemic to Australia. Twenty-four species are recognised and a key provided for their identification. The following species are described here as new: *Beyeria apiculata* Halford & R.J.F.Hend., *B. cockertonii* Halford & R.J.F.Hend., *B. constellata* Halford & R.J.F.Hend., *B. disciformis* Halford & R.J.F.Hend., *B. lanceolata* Halford & R.J.F.Hend., *B. lapidicola* Halford & R.J.F.Hend., *B. physaphylla* Halford & R.J.F.Hend., *B. rostellata* Halford & R.J.F.Hend., *B. simplex* Halford & R.J.F.Hend., *B. sulcata* Halford & R.J.F.Hend. and *B. villosa* Halford & R.J.F.Hend. A new subspecies and new variety are described, namely *Beyeria cinerea* subsp. *borealis* Halford & R.J.F.Hend. and *B. sulcata* var. *gracilis* Halford & R.J.F.Hend. The new combinations *Beyeria sulcata* var. *brevipes* (Airy Shaw) Halford & R.J.F.Hend., based on *B. brevifolia* var. *brevipes* Airy Shaw and *B. sulcata* var. *truncata* (Airy Shaw) Halford & R.J.F.Hend., based on *B. brevifolia* var. *truncata* Airy Shaw, are made. *Beyeria calycina* var. *minor* Airy Shaw is raised to specific rank as *B. minor* (Airy Shaw) Halford & R.J.F.Hend. The new taxa are illustrated and distinguished from related taxa while all taxa are described and mapped with notes provided on their habitat, distribution and phenology. Lectotypes are chosen for *Beyeria drummondii* Müll.Arg., *Beyeria latifolia* Baill., *Beyeria lechenaultii* forma *elaeagnoides* Baill., *Beyeria lechenaultii* forma *pernettiioides* Baill., *Beyeria lechenaultii* forma *rosmarinoides* Baill., *Beyeria lechenaultii* var. *latifolia* Grüning, *Beyeria lepidopetala* F.Muell., *Beyeria opaca* F.Muell., *Beyeria opaca* var. *linearis* Benth., *Beyeria viscosa* var. *amoena* Müll.Arg., *Beyeria viscosa* var. *angustifolia* F.Muell. & Tate, *Beyeriopsis latifolia* Müll.Arg. and *Croton viscosus* Labill. All known synonyms are listed here.

Key Words: Euphorbiaceae, *Beyeria*, *Beyeria apiculata*, *Beyeria cinerea* subsp. *borealis*, *Beyeria cockertonii*, *Beyeria constellata*, *Beyeria disciformis*, *Beyeria lanceolata*, *Beyeria lapidicola*, *Beyeria minor*, *Beyeria physaphylla*, *Beyeria rostellata*, *Beyeria simplex*, *Beyeria sulcata*, *Beyeria sulcata* var. *brevipes*, *Beyeria sulcata* var. *gracilis*, *Beyeria sulcata* var. *truncata*, *Beyeria villosa*, Australia, Australian flora, taxonomy, nomenclature, identification keys

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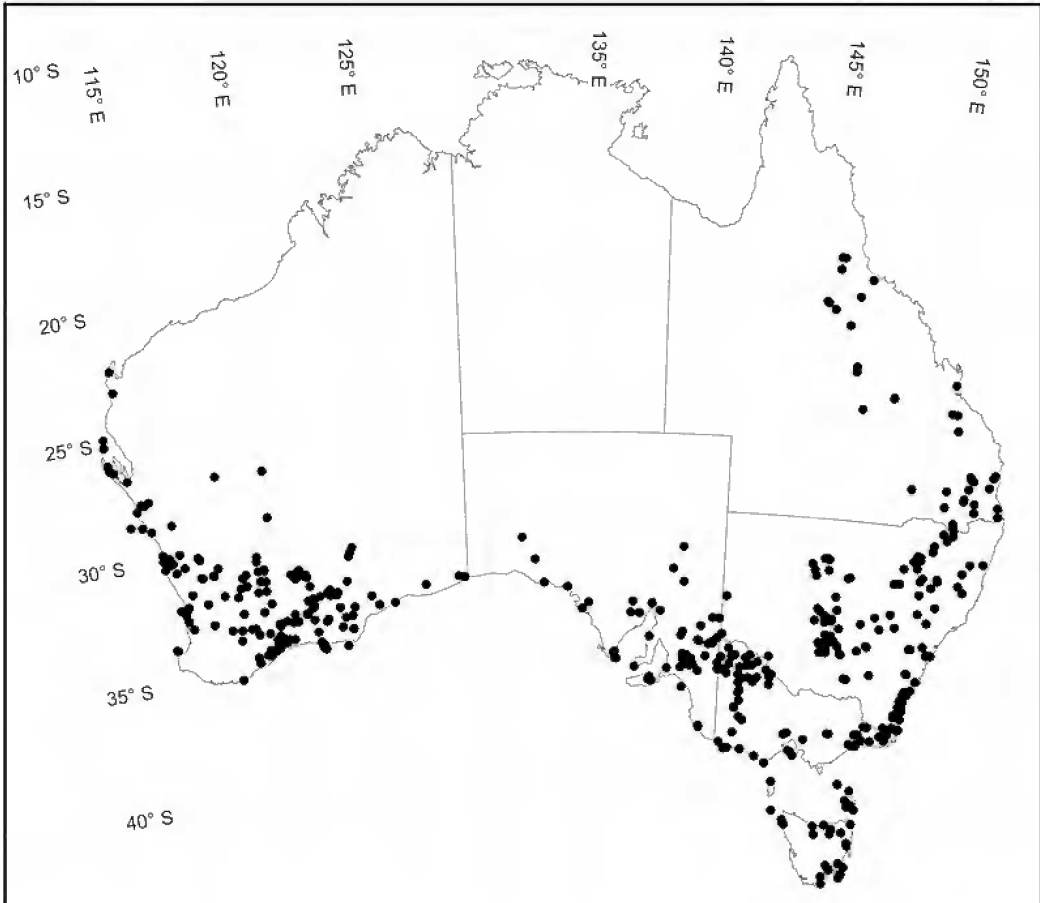
Introduction

Beyeria Miq. is endemic to Australia with 24 species recognised in the present revision. Species of *Beyeria* are woody, perennial shrubs or small trees and the majority grow in shrubland, heathland or dry sclerophyll open forest or woodland communities, in a variety of soils derived from diverse geologies. The species are largely temperate in their distribution (**Map 1**) with the majority endemic to south-western Australia.

The genus was established in 1844 by Friedrich Miquel who named a single species, *Beyeria viscosa* Miq., based on material collected by Ludwig Preiss in 1839 at Rottneest

Island, Western Australia (Miquel 1844). The name commemorates Adriaan de Beyer [de Beijer] (1773–1843) who Miquel described as a dedicated worker for his studies of cryptogamic plants in Batavia (Netherlands). For more detailed biographical information of A. de Beyer refer to Bouwer (2006). Miquel listed the following characters for his new genus: flowers dioecious and without petals, calyx 5-partite, anthers extrorse, ovary with uniovulate locules and stigma pileiform, entire and sessile. At the time, Miquel considered *Beyeria* showed affinities with the “tribe of Crotons”. However, he noted the stigma structure distinguished *Beyeria* from the genera of the tribe.

In 1845, Johann Klotzsch in Lehmann’s *Plantae Preissianae*, published the genus



Map 1. Distribution of the genus *Beyeria* in Australia.

Calyptrostigma Klotzsch to accommodate *Croton viscosus* Labill. and in a footnote described two new species (*Calyptrostigma ledifolium* Klotzsch and *C. oblongifolium* Klotzsch) based on collections in the Lindley Herbarium (now at CGE) and Willdenow Herbarium (now at B-Willd.), respectively (Klotzsch 1845). Labillardière based his *Croton viscosus* on material he collected from southern Australia in 1792 while a member of D'Entrecasteaux's expedition (Labillardière 1806). Klotzsch placed *Calyptrostigma* within the tribe *Crotoneae* Blume, but did not indicate the affinities of his new genus.

In the previous year Miquel (1844) had stated in the protologue of *Beyeria* that it had not been possible to confirm whether Labillardière's *Croton viscosus* was the same as his *Beyeria viscosa* as no specimen

of *Croton viscosus* was available to him at the time. However, he considered that Labillardière's species (*Croton viscosus*) seemed most likely to belong to his new genus *Beyeria*.

Eleven years later, Sonder (1857) transferred *Calyptrostigma ledifolium* and *C. oblongifolium* to *Beyeria* and created a new name, *Beyeria preissii* Sond., for the plants Klotzsch described under the name "*C. viscosum* Klotzsch" at the same time specifically excluding *Croton viscosus* of Labillardière. Sonder listed *Croton viscosum* Labill. as a synonym of *Beyeria viscosa*. The name *Beyeria preissii* was nomenclaturally superfluous when published by Sonder, since he included within this species a duplicate of the type of *B. viscosa* Miq.

In a precursory paper to the publication of De Candolle's *Prodromus*, Jean Müller (Müller Argovensis) (1865) established the genus *Beyeriopsis* and described five species (*B. cygnorum* Müll.Arg., *B. cinerea* Müll.Arg., *B. latifolia* Müll.Arg., *B. similis* Müll.Arg. and *B. brevifolia* Müll.Arg.) based on collections from south-western Western Australia made by James Drummond and Augustus Oldfield. He also transferred *Beyeria lepidopetala* F.Muell. to *Beyeriopsis*. He considered *Beyeriopsis* to be closely related to *Beyeria* from which it was distinguished on the basis of its staminal structure. *Beyeriopsis* was described as having staminal filaments bifid at the apex and anthers with 2 discrete separate locules compared with *Beyeria* which had staminal filaments entire and anthers with 2 separate but contiguous locules. Müller also divided *Beyeria* into two sections (*B. sect. Discobeyeria*, and *B. sect. Eubeyeria* (*nom. inval.* = *B. sect. Beyeria*)) based principally on the presence or absence of a disc and petals in the flowers. However, at the time, he did not arrange the then known species into the sections, but named two new species (*Beyeria drummondii* Müll.Arg. and *B. lasiocarpa* Müll.Arg.) which he indicated belonged to *B. sect. Discobeyeria* and *B. sect. Beyeria* respectively.

The following year in De Candolle's *Prodromus*, Müller (1866) maintained the two genera, enumerating seven species in *Beyeriopsis*, which included the new species *B. cyanescens* Müll.Arg. He divided the genus into two unnamed 'sections', one 'Flores dioici' contained *B. cygnorum*, *B. lepidopetala*, *B. cinerea* and *B. cyanescens* the other 'Flores monoici' contained *B. latifolia*, *B. similis* and *B. brevifolia*. Müller accepted five species as belonging to *Beyeria*, placing *B. backhousei* Hook.f. and *B. oblongifolia* (Klotzsch) Sond. in synonymy of *B. ledifolium* (Klotzsch) Sond. and *B. viscosa* respectively and recognising seven varieties; *B. viscosa* var. *genuina* (= *B. viscosa* var. *viscosa*), *B. viscosa* var. *oblongifolia*, *B. viscosa* var. *minor*, *B. viscosa* var. *amoena*, *B. ledifolia* var. *genuina* (= *B. ledifolia* var. *ledifolia*), *B. ledifolia* var. *backhousei* ('*backhousii*') and *B. ledifolia* var. *angustifolia*. He maintained the sectional division in *Beyeria* with *B. sect. Discobeyeria*

containing a single species *B. drummondii*, while *B. sect. Beyeria* contained *B. lasiocarpa*, *B. viscosa*, *B. ledifolia* and *B. opaca* F.Muell.

Baillon (1866) considered the differences in the androecium between *Beyeria* and *Beyeriopsis* were insufficient to warrant recognition of two genera. However, he didn't transfer the *Beyeriopsis* species of Müller's to *Beyeria*. Baillon transferred the name *Hemistema* ('*Hemistemma*') *lechenaultii* DC. to *Beyeria*, described *B. uncinata* Baill. (now in synonymy of *Eremophila sturtii* R.Br.), *B. lasiocarpa* forma *denudata* Baill., *B. lechenaultii* forma *genuina* (= *B. lechenaultii* forma *lechenaultii*), *B. lechenaultii* forma *pernettoides* Baill., *B. lechenaultii* forma *myrtooides* Baill., *B. lechenaultii* forma *rosmarinoides* Baill., *B. lechenaultii* forma *salsoloides* Baill., *B. lechenaultii* forma *vaccinioides* Baill. and placed *Calyptrostigma ledifolium*, *C. oblongifolium* and *B. drummondii* in synonymy of *B. lechenaultii* (DC.) Baill., *B. viscosa* and *B. opaca* respectively.

In his account of *Beyeria* in *Flora Australiensis*, Bentham (1873) followed Baillon in treating *Beyeriopsis* as congeneric with *Beyeria* and transferred Müller's *Beyeriopsis* species to *Beyeria*. He recognised 13 species, and described *B. viscosa* var. *linearis* Benth. and *B. opaca* var. *linearis* Benth., but did not comment on the infraspecific taxa previously published by Müller and Baillon. Bentham arranged the species into three sections based primarily on stamen and stigma features. The first section *Beyeria* sect. *Eubeyeria* (*nom. inval.* = *B. sect. Beyeria*) was characterised by "anthers twice as long as broad, adnate to an entire or scarcely lobed connective, stigma entire or scarcely lobed" and included four species namely *B. viscosa*, *B. opaca* (for which *B. lechenaultii*, *B. ledifolia* Sond. non Klotzsch and *B. backhousei* were listed as synonyms), *B. lasiocarpa* and *B. uncinata* (= *Eremophila sturtii*). The second section *Beyeria* sect. *Beyeriopsis* (*nom. superfl.*) was characterised by "anthers short, the locules quite distinct, either adnate to a deeply 2-lobed connective or partially free with the connective more entire and stigmas entire or scarcely lobed" and

contained eight species namely *B. latifolia*, *B. cygnorum* (Müll.Arg.) Benth., *B. cinerea* (Müll.Arg.) Benth., *B. cyanescens* (Müll.Arg.) Benth., *B. lepidopetala*, *B. similis* (Müll.Arg.) Benth., *B. brevifolia* (Müll.Arg.) Benth. and *B. drummondii* (for which *Calyptrostigma ledifolium* was listed as a synonym). The name *Beyeria* sect. *Beyeriopsis* was nomenclaturally superfluous when published by Bentham, since he included within this section *B. drummondii* which was the sole species Müller had included in the section he earlier had named *Beyeria* sect. *Discobeyeria*. The third section Bentham recognised was *Beyeria* sect. *Oxygyne* F.Muell. characterised by “anthers of *Beyeriopsis*, stigma deeply lobed male flowers in a loose raceme” and contained a single species namely *B. tristigma* F.Muell.

In the most recent and complete taxonomic treatment of *Beyeria*, Grüning (1913) recognised 12 species and, following Bentham, grouped them into three sections.

Grüning’s treatment of the genus differed from Bentham’s in excluding *Beyeria uncinata* (= *Eremophila sturtii* R.Br.), maintaining *B. lechenaultii* and *B. opaca* as separate species and placing *B. drummondii* and *B. backhousei* in synonymy of *B. lechenaultii*. Grüning maintained the four varieties of *Beyeria viscosa* described by Müller (1866), described *B. opaca* var. *longifolia* Grüning, *B. lechenaultii* var. *latifolia* Grüning and made new combinations from *B. backhousei*, *Calyptrostigma ledifolium*, *B. lechenaultii* forma *rosmarinoides* and *B. drummondii* as the varieties *B. lechenaultii* var. *backhousei* (Hook.) Grüning, *B. lechenaultii* var. *ledifolium* (Klotzsch) Grüning, *Beyeria lechenaultii* var. *rosmarinoides* (Baill.) Grüning and *B. lechenaultii* var. *drummondii* (Müll. Arg.) Grüning.

In the present study the authors have maintained the sectional division of *Beyeria* as presented by Grüning (1913) excluding *B. sect. Oxygyne*. Halford & Henderson (2005) established the genus *Shonia* R.J.F.Hend. & Halford to accommodate *Beyeria tristigma*, the sole species included in *B. sect. Oxygyne*. As stated previously (Halford & Henderson 2005, 2007; Webster 1994; Wurdack *et*

al. 2005) *Beyeria* is closely related to *Ricinocarpos* Desf., *Shonia* R.J.F.Hend. & Halford and *Bertya* Planch. within the Euphorbiaceae. *Beyeria* is distinguished from *Ricinocarpos*, *Shonia* and *Bertya* by the following combination of features: flowers in fascicles or cymose clusters or solitary, male flowers with staminal filaments free, erect to spreading on a flat or slightly convex to hemispherical receptacle and stigmas entire, dilated and forming a cap over the top of the ovary, discoid or rarely with 2 appressed limbs or shallowly 3-lobulate. For a key to the Australian genera of Euphorbiaceae tribe *Ricinocarpeae* refer to Halford and Henderson (2005).

Materials and methods

This revision is based on an assessment of morphological characters of about 1350 dried herbarium specimens and field studies undertaken by the second author from 1988 to 1992 and by the first author in 2006. Selected herbarium collections from herbaria AD, B, BRI, CANB, HO, K, LD, MEL, NE, NSW, P and PERTH were studied and annotated. Acronyms used here and elsewhere to indicate herbaria holding particular specimens are those listed by Holmgren *et al.* (1990). All specimens cited have been examined by one or both of the authors, unless indicated otherwise by ‘*n.v.*’.

Colour descriptions of vegetative and floral parts are either from the information on herbarium labels or from photographs taken by the second author during field studies. Measurements listed are based upon the total variation observed in the herbarium specimens examined. Information on plant size, flowering and fruiting times, and habitat of occurrence were obtained from herbarium labels. All measurements were made either on fresh material, dried material, material preserved in 70% ethanol or dried material reconstituted by placing in boiling water for a few minutes. The distribution maps were produced with MapInfo Version 3 and are based on herbarium specimen locality data.

Common abbreviations used in the text are N.P. (National Park), N.R. (Nature Reserve), N.S.W. (New South Wales), Qld (Queensland),

S.A. (South Australia), S.F./S.F.R. (State Forest/State Forest Reserve), Tas. (Tasmania), Vic. (Victoria), W.A. (Western Australia).

Taxonomy

Beyeria Miq., *Ann. Sci. Nat. Bot.* ser. 3, 1: 350–352, t. 15 (1844). **Type:** *B. viscosa* Miq.

Beyeriopsis Müll.Arg., *Linnaea* 34: 56 (1865). **Type:** *Beyeriopsis brevifolia* Müll.Arg., [= *Beyeria brevifolia* (Müll.Arg.) Benth.] (lecto: *vide* Wheeler 1975: 535).

Calyptrostigma Klotzsch in J.G.C.Lehmann, *Pl. Preiss.* 1(2): 175 (1845). **Type:** *C. viscosum* (Labill.) Klotzsch

Monoecious or rarely dioecious **shrubs or small trees**, often resinous on most parts; branches glabrous or with an indumentum of stellate or rarely simple hairs. **Leaves** spirally alternate, exstipulate, petiolate or rarely sessile, simple, entire, margins flat, recurved or revolute, marginal glands absent or present mostly on blade proximally. **Flowers** axillary or terminal on short axillary branchlets, pedicellate rarely ± sessile, in few-flowered fascicles or cymose clusters or solitary, bracteate, gamosepalous; calyx deeply 5(rarely 4 or 6)-lobed, subequal, imbricate (quincuncial); petals present, 5(rarely 4) or absent, slightly shorter than or equal in length

to calyx lobes; disc present or absent, of discrete alternipetalous glands or forming a continuous glandular ring. **Male flowers** with receptacle flat to hemispherical; stamens numerous (> 9); filaments free, ± erect or spreading, mostly bifid distally; anthers dorsifixed, extrorse, of two separate, parallel but contiguous cells, each transverse or lateral on the apex of the filament, dehiscent by longitudinal slits; pistillode absent. **Female flowers** with calyx lobes persistent, rarely accrescent; petals sometimes marcescent; ovary 2- or 3(rarely 1)-locular with one pendant ovule in each locule; style short or ± obsolete; stigma elobate or shallowly 3-lobulate, calyptriform, discoid, or rarely bipartite, persistent. **Fruits** capsular, ellipsoid, ovoid or subglobose, mostly trilobate, glabrous or densely hairy, smooth or papillose, mostly 2- or 3(rarely 1)-seeded, separating septically often into three 2-valved cocci leaving a persistent columella. **Seeds** ellipsoid and dorsi-ventrally compressed, globose or obloid, carunculate; testa smooth, shiny, often blotched; caruncle creamy-white, yellowish-white, or light brown, waxy-fleshy; endosperm copious; embryo linear, in the middle of the endosperm, cotyledons longer than the radicle.

Key to sections of *Beyeria*

Flowers apetalous or if rudimentary petals present then < half the length of calyx lobes; calyx lobes of male flowers spreading at anthesis

..... **B. sect. *Beyeria***

Flowers with petals, slightly shorter than or equal to calyx lobes; calyx lobes of male flowers ± erect, enclosing or appressed to androecium at anthesis

..... **B. sect. *Beyeriopsis***

Beyeria Miq. sect. **Beyeria**, Müll.Arg., *Linnaea* 34: 58 (1865). **Type:** *B. viscosa* Miq.

Beyeria sect. *Discobeyeria* Müll.Arg., *Linnaea* 34: 58 (1865). **Type:** *B. drummondii* Müll.Arg.

Beyeria sect. *Eubeyeria* Müll.Arg., *Linnaea* 34: 58 (1865), *nom. inval.*

Shrubs or small trees. **Flowers** apetalous or petals rarely present as rudimentary lobes. **Male flowers** with calyx lobes spreading at anthesis; receptacle convex to hemispherical; filaments entire; anthers of two separate, obloid or linear, parallel but contiguous cells, each lateral on the apex of the filament. **Female flowers** with stigmas calyptriform or rarely bipartite.

Distribution: The species of *Beyeria* sect. *Beyeria* occur in Western Australia, South Australia, Queensland, New South Wales, Victoria and Tasmania.

Key to species of *Beyeria* sect. *Beyeria*

- 1 Ovaries and fruits densely hairy, non-resinous (N.S.W., Qld, Vic.) **2. B. lasiocarpa**
1. Ovaries and fruits glabrous or with a few scattered hairs, usually resinous 2
- 2 Stigmas bipartite; lobes ± oblong, *c.* 1 mm long, appressed to ovary (S.A.) **5. B. subsecta**
2. Stigmas entire, calyptriform 3
- 3 Abaxial surface of leaf blades densely tomentellous with crispate hairs > 0.1 mm long, never resinous (N.S.W., S.A., Tas., Vic., W.A.) **3. B. lechenaultii**
3. Abaxial surface of leaf blades glabrous or densely puberulous with hairs < 0.1 mm long, often obscured by resinous covering 4
- 4 Leaf blades lanceolate; fruits 10–12 mm long (N.S.W., Vic.) **1. B. lanceolata**
4. Leaf blades narrow-elliptic to elliptic or narrow-obovate to obovate; fruits 5–9 mm long 5
- 5 Leaf blades narrow-obovate, 7–20 mm long, < 5 mm wide; ovaries 2-locular (N.S.W., S.A., Vic., W.A.) **4. B. opaca**
5. Leaf blades narrow-elliptic to elliptic or narrow-obovate to obovate, 20–90 mm long, 5–30 mm wide; ovaries 3-locular (N.S.W., Qld, S.A., Tas., Vic., W.A.) **6. B. viscosa**

1. *Beyeria lanceolata* Halford & R.J.F.Hend. **species nova** *B. viscosae* Miq. maxime affinis sed foliorum lamina lanceolata non angustelloidica usque ad obovata et fructibus longioribus (10–12 mm longis non 6–8 mm longis) differt. **Typus:** New South Wales. Neenah Creek, southern slopes of Nungatta Mt, *c.* 48 km SSW of Eden, 16 February 1984, *T. James 519 & M. Taylor* (holo: NSW; iso: MEL).

Illustration: Jeanes (1999: 67, fig. 10j) as *Beyeria viscosa*.

Diocious or occasionally monoecious, tall slender **shrubs or small trees** to 6 m high, resinous on young shoots, buds and adaxial leaf surface. Main trunk with fine flaky, reddish-brown bark. Young branchlets of unknown colour in fresh state, angular becoming terete with age, glabrous; older branchlets with grey, ± smooth bark. **Leaves** petiolate; petioles 3–6 mm long, glabrous, 3–6 pairs of sessile glands on adaxial face; blades lanceolate, 55–120 mm long, 6–16 mm wide, length:width ratio 7–15:1; adaxial surface glabrous and smooth;

abaxial surface papillose and sparsely hairy with stellate hairs *c.* 0.7 mm across (obscured by resinous covering); base cuneate; margins flat or slightly recurved; apex acute; midvein impressed adaxially, abaxially prominently raised, rounded and glabrous; secondary and tertiary veins obscure; marginal glands absent. **Flowers** pedicellate; male flowers axillary, solitary or in shortly pedunculate clusters of up to 4 flowers; female flowers axillary or terminal on a short axillary branchlet, solitary; peduncles up to 4 mm long, glabrous; bracts narrow-ovate, up to 3 mm long, rounded at apex, glabrous; pedicels ± angular, glabrous, stouter in female than in male flowers; calyx lobes 5, of unknown colour when fresh, glabrous; petals absent; disc obscure or absent. **Male flowers** with pedicels 7–9 mm long; calyx lobes broad-ovate, 3.2–4.5 mm long, 3–4 mm wide, concavo-convex, the margins erose, obtuse to rounded at apex; receptacle *c.* 2.5 mm across, glabrous; stamens 40; filaments ± erect, 0.1–0.3 mm long, glabrous, entire; anthers *c.* 1.3 mm long. **Female flowers** with pedicels

6–10 mm long; calyx lobes \pm appressed to and enclosing gynoecium apart from stigma, triangular to ovate, 2.5–3.5 mm long, 2–3.5 mm wide, the margins entire, rounded to obtuse at apex; ovary subglobose, \pm trigonal, *c.* 2.5 mm long, glabrous, thickly resinous, 3-locular; style *c.* 0.2 mm long, glabrous; stigma calyptriform, 1.9–2.5 mm across, umbilicate, glabrous, with margins entire. **Fruits** subglobose, 10–12 mm long, 9–12 mm across, 2- or 3-seeded, glabrous, smooth; persistent calyx *c.* one third the length of mature fruit. **Seeds** ellipsoid, dorsi-ventrally compressed, 5.7–6.5 mm long (including caruncle), 4–4.8 mm across, 3–3.1 mm in thickness; testa dark brown or mottled dark brown and grey; caruncle *c.* 1.5 mm long, and 2.5 mm wide, yellowish-white. **Fig. 1.**

Additional selected specimens examined: **New South Wales.** gully on the E side of Mt Wog Wog, Nalbaugh N.P., Dec 1985, *Albrecht 2343* (MEL, NSW); *c.* 4.8 km SSW of Nungatta Peak trig, Apr 1986, *Albrecht 2570* (MEL); Rock Flat Creek, Sep 1950, *Wakefield 4604* (MEL). **Victoria.** Mt Dandenong, Aug 1914, *Campbell s.n.* (MEL 114246); Dandenong Ranges below Mt Dandenong, May 1995, *Jeanes 176* (MEL); Sportsman Creek, Sep 1984, *Beauglehole ACB77347* (CANB, MEL); Haunted Stream, Oct 1977, *Gullan & Norris 208* (MEL); Bunga Creek, near Cunningham, Jan 1911, *St John s.n.* (MEL 622345); by Castleburn Creek on Dargo road, Sep 1979, *Walsh NGW130* (MEL); Mountain Creek, Deddick track crossing, 4.6 km NW of Mt Joan, Sep 1979, *Forbes 167* (MEL, NSW); Wulgulmerang, *c.* 70 km NNW of Orbost, Nov 1962, *Willis s.n.* (CANB, MEL 503120, NSW); Little River Gorge, *c.* 75 km N of Orbost, Nov 1968, *Willis s.n.* (MEL 114337); *c.* 0.5 km SW of Mt Merragunegin, Sep 1988, *Albrecht 3711* (MEL); Upper Genoa River, Oct 1948, *Wakefield 3186* (MEL); Upper Genoa River at junction with Yambulla Creek, Oct 1948, *Willis s.n.* (MEL 114244).

Distribution and habitat: *Beyeria lanceolata* is known from Nungatta and Nalbaugh National Parks, southern New South Wales and in the Dandenong Ranges and East Gippsland, Victoria (**Map 2**). It grows on sheltered rocky hillslopes and in gullies in open eucalypt forest communities with rainforest understorey shrubs.

Phenology: Flowers have been collected throughout the year, particularly from August to January, fruits from September to March.

Affinities: *Beyeria lanceolata* is morphologically most similar to *B. viscosa* but differs by its lanceolate rather than narrow-

elliptic to obovate leaf blades and its larger subglobose fruit which are 10–12 mm long compared with 6–8 mm long in *B. viscosa*.

Etymology: The specific epithet is from the Latin *lanceolatus*, lanceolate, and alludes to the shape of the leaf blades in this species.

2. *Beyeria lasiocarpa* Müll.Arg., *Linnaea* 34: 59 (1865); *Beyeria lasiocarpa* Müll.Arg. forma *lasiocarpa*, Baill., *Adansonia* 6: 307 (1866).

Type: [New South Wales.] Twofold Bay, *s.d.*, *F. Mueller* (holo: G-DC *n.v.* (microfiche IDC 800-73. 2454: II. 7); iso: MEL [4 sheets 114153, 114154, 114156, 114157], NSW 465094).

Illustrations: Costermans (1986: 211); Jeanes (1999: 67, fig. 10k).

Dioecious or rarely monoecious, spreading, much-branched **shrubs** to 3 m high, thinly resinous on most parts. Young branchlets pale green and angular becoming grey and terete with age, glabrous; older branchlets with grey to black shallowly fissured bark. **Leaves** petiolate; petioles 3–7 mm long, glabrous, with up to 5 pairs of sessile glands on adaxial face; blades narrow-elliptic, narrow-obovate or very narrow-ovate, 30–110 mm long, 7–20 mm wide, length:width ratio 5–15:1; adaxial surface glabrous and \pm smooth; abaxial surface densely hairy with \pm sessile, stellate hairs 0.1–0.2 mm across; base cuneate; margins slightly recurved; apex obtuse to acute or rounded, sometimes ultimately apiculate with extension from midrib; apiculum slender, < 0.2 mm long; midvein slightly impressed adaxially, abaxially raised, glabrous; secondary veins slightly impressed or obscure adaxially, abaxially slightly raised; tertiary veins obscure; marginal glands absent. **Flowers** pedicellate, males axillary, in shortly pedunculate cymose clusters of up to 4 flowers or rarely solitary, females axillary or terminal on short axillary branchlets, solitary or rarely in shortly pedunculate cymose clusters of up to 3 flowers; peduncles up to 5 mm long, glabrous; bracts \pm triangular, 1–3 mm long, acute at apex, \pm glabrous; pedicels glabrous, stouter and longer on female flowers than on male flowers; calyx lobes 5, green, white puberulous abaxially, glabrous adaxially, the margins erose, rounded at apex; petals absent; disc \pm a continuous ring, glabrous.

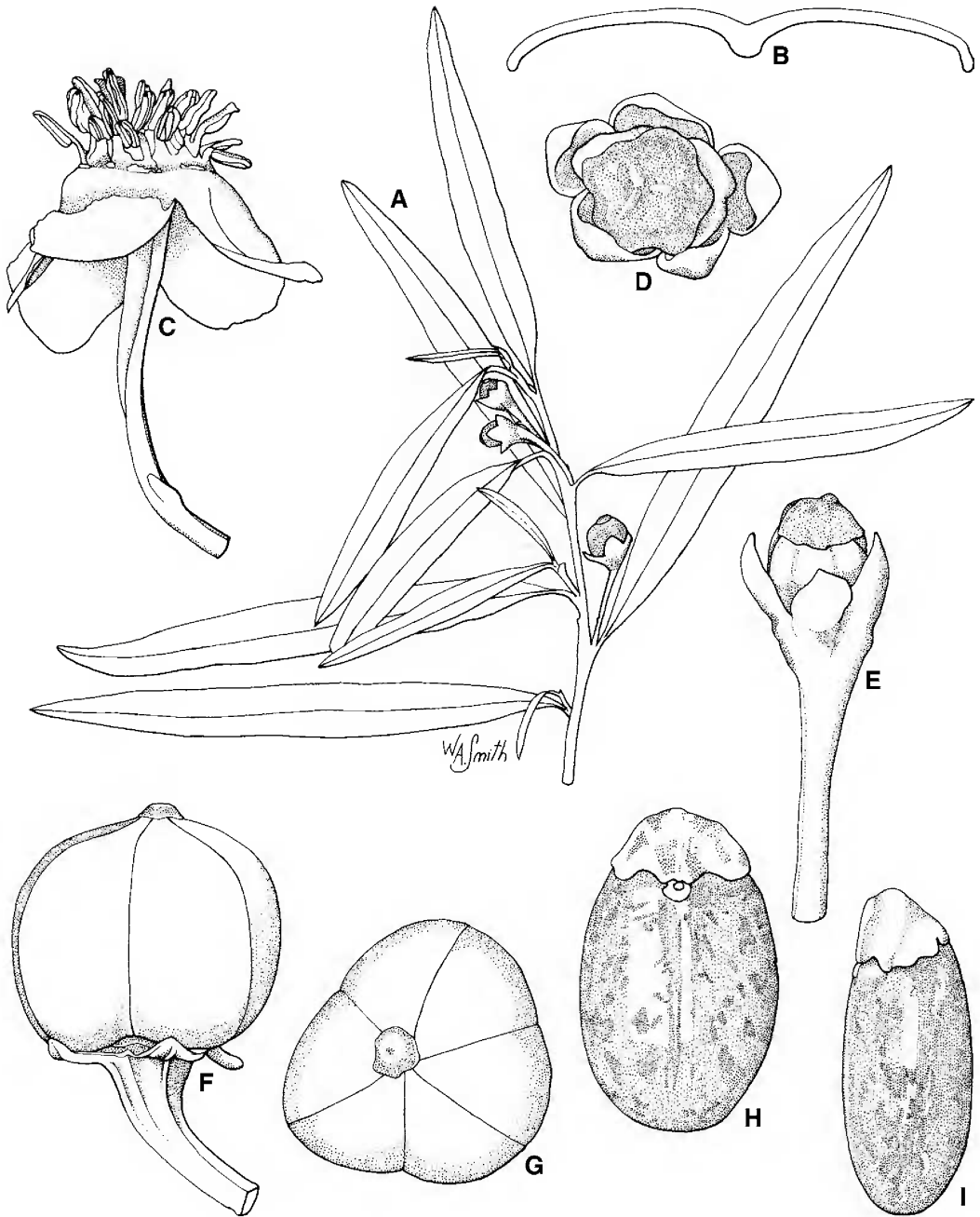


Fig. 1. *Beyeria lanceolata*. A. branchlet with female flowers $\times 1$. B. transverse section of leaf $\times 9$. C. side view of male flower $\times 6$. D. face view of female flower $\times 9$. E. side view of female flower $\times 6$. F. side view of fruit $\times 3$. G. face view of fruit $\times 6$. H. abaxial view of seed $\times 6$. I. side view of seed $\times 60$. A–E from *Jeanes 176* (MEL), F–I from *James 519 & Taylor* (NSW). Del. W. Smith.

Male flowers with pedicels 4–5 mm long; calyx lobes broad-ovate, 3–4 mm long, 3–4.5 mm wide; receptacle *c.* 3 mm across, stellate-tomentose; stamens 35–50; filaments erect, 1–1.5 mm long, glabrous or with a few simple hairs proximally; anthers 0.7–1 mm long. **Female flowers** with pedicels 7–15 (–20) mm long; calyx lobes spreading, ovate to broad-ovate or suborbicular, 3–5 mm long, 1.8–5.5 mm wide; ovary subglobose, ± trigonal, *c.* 3 mm long, densely hirsute, 3-locular; style up to 0.7 mm long, hirsute; stigma calyptriform, 3–5 mm across, umbilicate, glabrous, with margins irregularly toothed. **Fruits** depressed globose, 6–10 mm long, 7–10 mm across, 3-seeded, moderately hairy with simple ± erect hairs < 1.5 mm long; persistent calyx *c.* one third the length of mature fruit. **Seeds** ellipsoid, dorsi-ventrally compressed, 4–5.5 mm long (including caruncle), 2.3–3.7 mm across, 2–2.8 mm in thickness; testa black to dark brown; caruncle 0.6–1.5 mm long, 1.5–2.3 mm wide, light brown.

Additional selected specimens examined: Queensland. WIDE BAY DISTRICT: Swain Peak, 7 km NW of Yandina, Mar 1993, *Bean 5808* (BRI); Gheerulla Falls, 5 km W of Mapleton, Nov 1990, *Bean 2686* (BRI). MORETON DISTRICT: Neurum Creek, between Mt Delaney & Mt Archer, Mar 1989, *Forster PIF5006 et al.* (BRI); 4.3 km past bridge over Little Nerang Creek, Mudgeeraba to Springbrook road, Feb 1991, *Forster PIF7802 & Leiper* (BRI). **New South Wales.** Upper Guy Fawkes River, Boundary Creek, Jan 1992, *Glimour 7297* (BRI, MEL, NSW); Doyles River S.F., 88 km SE of Walcha, on the Oxley Highway, Aug 1985, *Foreman 988* (BRI, MEL, NE, NSW); Deua N.P., Diamond Creek, below 3rd waterfall, Jan 1994, *Taws 357 & Scott* (NSW); Carters Creek, Currowan S.F., NW of Batemans Bay, Dec 1973, *Pullen & Story 8747* (BRI, CANB, MEL, NSW, PERTH); North Brooman S.F., *c.* 4.8 km NW of Termeil, Nov 1973, *Pullen & Story 8625* (BRI, NSW); Pebbly Beach, 20 km NE of Batemans Bay, Dec 1969, *Briggs 3108* (NSW); Bemboka S.F., 2.6 km at 80° from Bemboka Peak, Mar 1992, *Telford 11564 & Crawford* (BRI, MEL, NSW); summit of Dr Georges Mt, 10 km NE of Bega on Tanja road, Jul 1995, *Jobson 3648* (MEL, NSW); Mt Dromedary, Dec 1962, *Adams 505* (BRI, MEL, NSW); Egan Peaks N.R., Sep 1984, *Albrecht 856* (MEL, NSW); 0.5 km upstream from Newtons Flat along creek, Nadgee N.R., Oct 1992, *Zich 199* (CANB, NSW). **Victoria.** Fainting Range track, 1.5 km E of Tambo River, Jan 1984, *Parkes EG147A* (MEL); *c.* 100 m N of junction between Mottle Range road and Monument track, 6 km SSE of Mt Tara, Jan 1984, *Parkes EG155* (BRI, MEL); between Snowy River at Wood Point and Long Point track, Aug 1979, *Walsh NGW178* (MEL); beside un-named creek falling N to Genoa River, 3.7 km NE from township, Oct 1991, *Walsh 3205* (BRI, MEL).

Distribution and habitat: *Beyeria lasiocarpa* occurs in coastal and subcoastal areas of eastern Australia from Mapleton, south-eastern Queensland, southwards through New South Wales to Bairnsdale, East Gippsland, Victoria (**Map 3**). It grows in wet sclerophyll forest and moist gullies and shaded sites in dry sclerophyll forest communities and on rainforest margins.

Phenology: Flowers and fruits have been collected throughout the year.

Affinities: *Beyeria lasiocarpa* is similar to *B. viscosa* but can be distinguished by its densely hairy (rather than glabrous) ovary and fruits and the lack of resin on the abaxial surface of its leaf blades.

3. *Beyeria lechenaultii* (DC.) Baill., *Adansonia* 6: 307 (1866), (*'leschenaultii'*); *Hemistema* (*'Hemistemma'*) *lechenaultii* DC., *Syst. Nat.* 414 (1817); *Beyeria lechenaultii* (DC.) Baill. forma *lechenaultii*, Baill., *Adansonia* 6: 307 (1866); *Beyeria lechenaultii* (DC.) Baill. var. *lechenaultii*, Grüning in A. Engler, *Pflanzenr.* H58: 70 (1913). **Type:** [South Australia.] Novo Holl. et ile St. Francois [St Francis Isles], *s.d.*, *Leschenault s.n.* (holo: G-DC *n.v.*, (microfiche IDC 800-73. 41: I. 1); iso: P 152760 (photo at BRI)).

Beyeria lechenaultii forma *elaegnoides* Baill., *Adansonia* 6: 308 (1866), (*'eloeagnoides'*). **Type:** [Victoria.] near Lake King, February 1855, *F. Mueller s.n.* (lecto [here chosen]: MEL 114170).

Beyeria lechenaultii forma *myrtoides* Baill., *Adansonia* 6: 308 (1866). **Type:** [Victoria.] Cape Otway, *s.d.*, [*F. Mueller?*] (holo: MEL 114177).

Beyeria lechenaultii forma *pernettoides* Baill., *Adansonia* 6: 307–308 (1866). **Type:** [Victoria.] Portland, *s.d.*, *W. Allett s.n.* (lecto [here chosen]: MEL 114182).

Beyeria lechenaultii forma *rosmarinoides* Baill., *Adansonia* 6: 308 (1866); *Beyeria lechenaultii* var. *rosmarinoides* (Baill.) Grüning in A. Engler, *Pflanzenr.* H58: 70 (1913), *nom. superfl. et incor.* **Type:** [Victoria.] summit of Mount Ligar, *s.d.*, [*F. Mueller?*] (lecto [here chosen]: MEL 114186; isolecto: MEL 114179).

Beyeria lechenaultii forma *salsoloides* Baill., *Adansonia* 6: 308 (1866). **Type:** [Victoria.] N.W. Victoria, *s.d.*, *Mr Lockhart Morton s.n.* (holo: MEL 114181).

Beyeria lechenaultii forma *vaccinioides* Baill., *Adansonia* 6: 308 (1866). **Type:** [Victoria.] mouth of the Glenelg [River], *s.d.*, *W. Allett s.n.* (holo: MEL 114180).

Beyeria lechenaultii var. *latifolia* Grüning in A. Engler, *Pflanzenr.* H58: 71 (1913). **Type:** [Victoria.] Cape Otway, *s.d.*, [*F. Mueller?*] (lecto [here chosen]: MEL 114177).

Beyeria backhousei Hook.f., *Fl. Tasman.* 1: 339 (1857), ('*backhousii*'); *Beyeria ledifolia* var. *backhousei* (Hook.f.) Müll. Arg. in A. DC., *Prodr.* 15(2): 203 (1866), ('*backhousii*'); *Beyeria lechenaultii* var. *backhousei* (Hook.f.) Grüning in A. Engler, *Pflanzenr.* H58: 70 (1913), ('*backhousii*'). **Type:** [Tasmania.] Flinders Island, Bass Straits, *s.d.*, *R.C. Gunn 540* (syn: K); [Tasmania.] Flinders Island, *s.d.*, *J. Backhouse s.n.* (syn: K).

Beyeria drummondii Müll. Arg., *Linnaea* 34: 58–59 (1865); *Beyeria lechenaultii* var. *drummondii* (Müll. Arg.) Grüning in A. Engler, *Pflanzenr.* H 58: 70–71 (1913). **Type:** [Western Australia.] *s.loc.*, *s.d.*, *J. Drummond 214* (lecto [here chosen]: G-DC *n.v.* [microfiche IDC 800-73. 2454: II. 6]; isolecto: K, PERTH).

Calyptrostigma ledifolium Klotzsch in J.G.C. Lehmann, *Pl. Preiss.* 1: 176 (1845); *Beyeria ledifolia* (Klotzsch) Sond., *Linnaea* 28: 565 (1857); *Beyeria ledifolia* (Klotzsch) Sond. var. *ledifolia*, Müll. Arg. in A. DC., *Prodr.* 15(2): 203 (1866); *Beyeria lechenaultii* var. *ledifolia* (Klotzsch) Grüning in A. Engler, *Pflanzenr.* H58: 70 (1913). **Type:** [Western Australia.] in New Holland, *s.d.*, *J. Drummond s.n.* (holo: *n.v.*).

Beyeria ledifolia var. *angustifolia* Müll. Arg. in A. DC., *Prodr.* 15(2): 203 (1866). **Type:** [Western Australia.] at King George Sound, 1860, *Cuming s.n.* (holo: G-DC *n.v.* [microfiche IDC 800-73. 2455: I. 1]).

Beyeria opaca var. *linearis* Benth., *Fl. Austral.* 6: 65 (1873), *Beyeria lechenaultii* var. *rosmarinoides* Ewart, *Fl. Victoria* 726 (1930), *nom. illeg.* **Type:** [South Australia.] near

Adelaide, *s.d.*, *Blandowski s.n.* (lecto [here chosen]: K).

Beyeria viscosa var. *angustifolia* F. Muell. & Tate, *Trans. & Proc. Roy. Soc. South Australia* 16: 341 (1896). **Type:** [Western Australia.] Fraser Range, 23 October 1891, *R. Helms s.n.* (lecto [here chosen]: MEL 1560026; isolecto: NSW [3 sheets 257570, 257573, 257576,]).

Beyeria lechenaultii var. *latifolia* Ewart, *Fl. Victoria* 726 (1931), *nom. illeg. non* Grüning (1913). **Type:** not designated.

Beyeria lechenaultii forma *genuina* Baill., *Adansonia* 6: 307 (1866), *nom. inval.* [ICBN, Art. 24.3].

Beyeria ledifolia var. *genuina* Müll. Arg. in A. DC., *Prodr.* 15(2): 203 (1866), *nom. inval.* [ICBN, Art. 24.3].

Beyeria lechenaultii var. *genuina* Grüning in A. Engler, *Pflanzenr.* H58: 70 (1913), *nom. inval.* [ICBN, Art. 24.3].

Illustrations: Cunningham *et al.* (1982: 453); Costermans (1986: 211); Weber (1986: 742, fig. 398a); Jeanes (1999: 67, fig. 10h); Corrick & Führer (2000: 81).

Dioecious or rarely monoecious, open to dense, spreading to erect **shrubs** up to 2 m high, usually resinous on most parts. Young branchlets pale green when fresh, angular becoming terete with age, with resinous longitudinal ridges, puberulous between ridges but usually obscured by resinous covering; older branchlets with grey or pale brown, ± tessellated bark. **Leaves** petiolate; petioles 1–3 mm long, ± glabrous, glands absent; blades linear to narrow-oblong, narrow-obovate to obovate, narrow-elliptic to elliptic or rarely narrow-ovate, 9–40 mm long, 0.9–15 mm wide, length:width ratio 2–25:1; adaxial surface glabrous and smooth, usually thickly resinous; abaxial surface densely woolly with crispate hairs up to 1 mm long; base cuneate, obtuse or rounded; margins flat or slightly to strongly recurved sometimes to midrib concealing abaxial leaf surface; apex acute, rounded to truncate, emarginate or rarely obcordate, sometimes ultimately apiculate with extension from midrib; apiculum stout, up to 0.5 mm long,

bent upward; midvein obscure or slightly impressed adaxially, abaxially prominently raised, rounded and glabrous; secondary and tertiary veins obscure; marginal glands occasionally present at base of blade, 1 or 2 per side of midrib, sessile, smooth, *c.* 0.1 mm across. **Flowers** pedicellate, males axillary, solitary or in shortly pedunculate clusters of up to 3 flowers, females axillary or terminal on short axillary branchlet, solitary; peduncles up to 1 mm long, resinous; bracts narrow-ovate, up to 3 mm long, acute at apex, \pm glabrous; pedicels \pm angular, puberulous but usually concealed by resinous covering, stouter on female than on male flowers; calyx lobes 5 (rarely 4 in male flowers), pale green; petals absent or rarely present in male flowers as small rudimentary lobes; disc a continuous glandular ring, \pm fleshy, glabrous. **Male flowers** with pedicels 3.5–10 mm long; calyx lobes broad-ovate or suborbicular, 1–3.2 mm long, 1–3 mm wide, concavo-convex, puberulous abaxially medially, glabrous adaxially, the margins erose, obtuse to rounded or acute at apex; receptacle 1–1.5 mm across, densely hairy or with a few scattered hairs; stamens 10–60; filaments \pm erect, 0.1–0.3 mm long, glabrous, entire; anthers 0.3–1 mm long. **Female flowers** with pedicels 2–10 mm long; calyx lobes \pm appressed to and enclosing gynoecium apart from stigma, triangular to ovate, 1–2 mm long, 0.8–1.5 mm wide, puberulous abaxially, glabrous adaxially, the margins entire, acute, rounded to obtuse at apex; ovary subglobose and \pm trigonal or laterally compressed, 1.2–2 mm long, glabrous or sometimes with scattered stellate hairs, thickly resinous, 3 (rarely 2)-locular; style 0.3–0.7 mm long, glabrous; stigma calyptriform, 1–1.8 mm across, shallowly umbilicate, glabrous, with margins erose. **Fruits** ellipsoid-subglobose, rarely 3-lobate, 4.5–8 mm long, 3.8–7 mm across, 2- or 3-seeded, glabrous, \pm smooth; persistent calyx *c.* one third the length of mature fruit. **Seeds** ellipsoid, dorsi-ventrally compressed, 3.5–6.8 mm long (including caruncle), 2–4 mm across, 1.5–3.3 mm in thickness; testa dark brown or mottled dark and light brown; caruncle 0.7–1.3 mm long, 1.2–2.6 mm wide, yellowish-white.

Distribution and habitat: *Beyeria lechenaultii* occurs in southern Australia south of latitude 30° from near Perth, Western Australia eastward through South Australia to the Griffith area, New South Wales, Lake Entrance, Victoria, Bass Strait Islands and the north-west coast of Tasmania, with a disjunct population recorded in the Pilliga area, New South Wales (**Map 4**). In inland areas it mainly grows in shrubland, mallee, and open woodland communities, in sandy loams or red earths, on undulating plains or occasionally in mountain ranges, gorges or associated with rocky outcrops. In coastal areas it grows in heathland and shrubland communities in sandy soils on coastal dunes or rocky headlands.

Phenology: Flowers have been recorded throughout the year, particularly from July to December, fruits in March and April and from July to January.

Typification: In the protologue of *Beyeria lechenaultii* forma *elaegnoides*, Baillon (1866) cited two collections ‘*Wilhelmi*, Port Lincoln (herb. F.Muell.!)’ and ‘*F. Mueller*, prope Lake King Island, in virgultis (herb.!)’. Two collections, which are considered as syntypes of the name *B. lechenaultii* forma *elaegnoides*, have been located amongst material loaned to BRI from MEL [114170 and 114208]. The sheet 114170 has been selected as lectotype because it is part of original material and has morphology that agrees with the brief description in Baillon’s protologue of this forma.

In the protologue of *Beyeria lechenaultii* forma *pernettiioides*, Baillon (1866) cited four collections from F. Mueller’s herbarium (now MEL). Four collections [114174, 114182, 114195 and 114204] which are considered to be syntypes and one collection [2062920] considered to be a possible isosyntype have been located amongst material on loan to BRI from MEL. The collection made by *Allett* from Portland [114182] is here selected as the lectotype because it is the most ample and best preserved of the specimens and has morphology that agrees with the brief description given in Baillon’s protologue of this forma.

In the protologue of *Beyeria lechenaultii* forma *rosmarinoides*, Baillon (1866) cited some 12 collections, two from Preiss's herbarium and ten from F. Mueller's herbarium (now MEL). The Mueller collection labelled "summit of Mount Ligar" [MEL 114186] is here selected as the lectotype of this name because it is part of the original material and has morphology that agrees with the brief description given in Baillon's protologue of this forma.

In the protologue of *Beyeria lechenaultii* var. *latifolia*, Grüning (1913) cited two specimens namely 'without location details, (F. Mueller !)' and 'Victoria. Sorrento, (Weindorfer !)'. He also made reference to four names, '*Beyeria lechenaultii* var. β - ϵ Baill.' (= *Beyeria lechenaultii* forma *pernettiioides* Baill., *Beyeria lechenaultii* forma *elaegnoides* Baill., *Beyeria lechenaultii* forma *myrtooides* Baill. and *Beyeria lechenaultii* forma *vaccinioides* Baill.). We have been unable to locate either of the two specimens cited. To fix the application of Grüning's *Beyeria lechenaultii* var. *latifolia*, the type of *Beyeria lechenaultii* forma *myrtooides* Baill., is here selected as lectotype of Grüning's name because of the material located it best fits the description given in Grüning's protologue of this variety.

In the protologue of *Beyeria drummondii*, Müller (1865) cited two James Drummond collections from Western Australia, namely "In Nova Hollandia austre-occidentali ad Swan River (*Drummond n. 13! 214!*)". We have been unable to locate material of *Drummond n. 13* in loans from K or PERTH and it is not recorded on the microfiche of De Candolle's herbarium. However, we have seen on the microfiche of De Candolle's herbarium (G-DC) what we considered to be the syntype *Drummond n. 214*. As well we have located two isosyntypes amongst material loaned to BRI from PERTH and K. The collection (*Drummond 214*) that is located at G-DC is here selected as the lectotype of Müller's name because it is part of original material and has morphology that agrees with the description in Müller's protologue of this species.

In the protologue of *Beyeria viscosa* var. *angustifolia*, Mueller & Tate (1896) cited a single collection from Fraser Range collected by R. Helms on the Elder Expedition in the north-west of South Australia and across the Great Victoria Desert of Western Australia. We have located three duplicates (one at MEL and two at NSW). The MEL specimen [1560026] is here selected as the lectotype of this Mueller name because it is part of original material and has morphology that agrees with the description in Mueller's protologue of this species.

In the protologue of *Beyeria opaca* var. *linearis*, Bentham (1873) cited two collections, namely 'Alps on the Macalister, F. Mueller; near Adelaide, Blandowski'. A single sheet containing both specimens was located amongst material loaned to BRI from K. The specimen collected by Blandowski (on the left of the sheet) is here selected as the lectotype of Bentham's name because it has morphology that agrees with the protologue and is the more ample of these two collections.

Affinities: *Beyeria lechenaultii* is morphologically most similar to *B. subsecta* but differs in having generally larger leaves (9–40 mm long \times 0.9–1.5 mm wide compared with 4–10 mm long \times 0.8–1.6 mm wide) and fruits (4.5–8 mm long \times 3.8–7 mm across compared with *c.* 3 mm long and 2.5 mm across), and female flowers with an entire rather than a bipartite stigma.

Notes: In the past, *Beyeria lechenaultii* has been confused with *B. sulcata* var. *sulcata* in the western part of its range but is easily distinguished from this taxon by having apetalous flowers or petals reduced to small rudimentary lobes compared with petalous flowers in *B. sulcata* var. *sulcata*.

This species, as circumscribed here, varies considerably in the length and width of its leaves. This variation has led several authors in the past to formally describe many infraspecific and specific taxa (Hooker 1857; Müller 1865; Baillon 1866; Grüning 1913). Much more material has since been collected and although the extreme forms within this species differ considerably from each other, much of the morphological variation appears

to intergrade, making it difficult in assigning material to one or other of them. For this reason we have not formally recognised these variants. However, the more notable variants are discussed below.

‘Typical variant’ sens. lat.

Leaf blades linear to narrow-oblong or rarely narrow-obovate, mostly 9–27 mm long, 1.5–3.5 mm wide, the margins strongly recurved almost to midrib or sometimes to midrib concealing abaxial leaf surface, apex mostly rounded to truncate. **Male flowers:** calyx lobes 5, 1.5–3.2 mm long, stamens 20–60. **Female flowers:** ovary 3-locular. **Fruits** 6–8 mm long.

This is the most widespread variant and occurs from York, Western Australia, eastwards through South Australia to New South Wales and north-western Victoria.

Selected specimens examined: Western Australia. Yallari Reserve [Yallarin], Jun 1925, *Franks 43* (PERTH); c. 35 km SE of Coolgardie, on road to Norseman (Coolgardie–Esperance Highway), Sep 1988, *Henderson H3165* (BRI); 3.5 miles [c. 6 km] E of Eucla, Oct 1966, *George 8511* (NSW, PERTH); McPherson Rock, 31 km S of Norseman, Aug 1975, *Crisp 972* (CANB, PERTH); 27 km S from Balladonia towards Mt Ragged, Sep 1983, *Taylor 1525 & Ollerenshaw* (CANB, MEL); near Point Dover, Jul 1967, *Wilson 5946* (PERTH). **South Australia.** c. 2 km N of New West Bore, Bibliando Station, Apr 1974, *Crisp 733* (AD, CANB); Ceduna, Sep 1968, *Canning WA/68 2324* (CANB); 3 Calpatanna Waterhole Conservation Park, c. 26 km SSE of Streaky Bay, Nov 1989, *Davies 1449 & Hadlow* (MEL); Bay of Shoals, Kangaroo Island, Aug 1984, *Weston 6* (CANB); by Chauncey’s Line, c. 5 km SE of Harriet Hill and c. 18 km SW of Murray Bridge, Oct 1958, *Schodde 911* (AD). **New South Wales.** Pilliga Scrub, Aug 1953, *Jordan s.n.* (AD 966071380); c. 2 km N of Goolgowi towards Merriwagga, Oct 1989, *Henderson & Turpin H3323* (BRI, NSW); 4 km W of Kamarah, Nov 1975, *Crisp 1508* (AD, CANB); 2.3 km WNW of Kamarah on the Ardlethan–Griffith road, Apr 1988, *Dalby 88/13 et al.* (MEL, NSW). **Victoria.** Sunset Country, Millewa South Bore track, c. 0.3 km S of Bore to first major dune crest, Aug 1986, *Lucas 207* (MEL); Big Desert, 8 km S of Murrayville on Nhill road, Oct 1979, *Corrick 6389* (AD, MEL); 30.6 km SE of Walpeup on road to Patchewollock, Oct 1980, *Corrick 6701 et al.* (AD, CANB, MEL); 9 km W of Swan Hill on road to Sea Lake, Sep 1989, *Henderson & Turpin H3270* (BRI); 2.7 km NE of Dimboola, Aug 1995, *Jobson 3715* (BRI, MEL).

‘Broad-leafed variant’

Leaf blades narrow-elliptic to elliptic, narrow-obovate to obovate or rarely narrow-ovate, mostly 10–30 mm long, 2.5–13 mm wide, the margins flat or slightly recurved, apex obtuse, acute or rounded, rarely emarginate, sometimes ultimately apiculate with extension from midrib. **Male flowers:** calyx lobes 5, 2.5–3 mm long, stamens 20–35. **Female flowers:** ovary 3-locular. **Fruits** 6–7 mm long.

Occurs mostly in coastal areas from Fowlers Bay, South Australia, east to Lakes Entrance, Victoria, and onto the Bass Strait Islands and the north-west corner of Tasmania. Also occurs on Mt Arapiles and Mitre Rock in north western Victoria.

The following names placed in synonymy of *Beyeria lechenaultii* are applicable to this variant: *B. lechenaultii* forma *elaeagnoides* Baill., *B. lechenaultii* forma *myrtooides* Baill., *B. lechenaultii* forma *pernettoides* Baill., *B. lechenaultii* forma *vaccinioides* Baill., *B. lechenaultii* var. *latifolia* Gruning and *B. backhousei* Hook. f.

Selected specimens examined: South Australia. Cape Wiles, Mar 1960, *Filson 1608* (MEL); far SW tip of Yorke Peninsula, Innes N.P., Sep 1989, *Smith 89/17* (MEL); Beachport, Jan 1963, *Womersley 10* (MEL, NSW). **Victoria.** Mitre Rock, Sep 1996, *Ross 3791* (MEL); Mt Arapiles, Nov 1968, *Beaulehole ACB29646* (MEL); Kalimna Heights, Clara Street, Dec 1995, *Stephens 14* (MEL); Glenelg River mouth track to near Ocean Beach carpark, Dec 1983, *Forbes 1925 & Beaulehole* (MEL); Port Campbell N.P., Oct 1966, *Finck & Beaulehole ACB21640* (MEL, NSW); Otways, Parker River, c. 100 m upstream from mouth, Jan 1991, *Albrecht 4696* (MEL); Cape Schanck coastal park, Nov 1982, *Beaulehole ACB71544 & Elmore* (MEL). **Tasmania.** King Island, Golf Links, Currie Harbour, Jan 1968, *Cameron s.n.* (HO 27189); Erith Island, Kents Group, Bass Strait, Dec 1987, *Whinray 9030* (MEL); Prime Seal Island, Furneaux Group, Aug 1972, *Whinray 1473* (MEL); W end of Trouser Point, Flinders Island, Oct 1985, *Collier 782* (HO); Cape Barren Island, Furneaux Group, Oct 1973, *Whinray 606* (MEL); Australian Point, Apr 1984, *Moscal 7874* (HO, MEL); Temma, Feb 1976, *Richley s.n.* (HO 27722).

‘Narrow-leafed variant’

Leaf blades linear, mostly 10–30 mm long, 0.9–1.2 mm wide, the margins strongly recurved to midrib concealing abaxial leaf surface, apex obtuse, rounded or rarely orbiculate. **Male flowers:** calyx lobes 4 or

5, 1–1.7 mm long, stamens 10–24. **Female flowers:** ovary 2- or 3-locular. **Fruits** 4.5–5 mm long.

Occurs in coastal or near coastal areas from Beaufort Inlet eastward to near the Oldfield River in Western Australia.

This variant has generally shorter and narrower leaves as well as generally smaller male flowers, occasionally 2-locular ovaries and generally smaller fruit than the other variants *Newbey 1245* & *11231* (both PERTH). Two collections (*Newbey 1245* (PERTH) and *Newbey 11231* (PERTH)), which are relatively atypical for this variant, have leaves with orbiculate or emarginate apices.

The names *Beyeria drummondii* Müll. Arg. and *B. lechenaultii* var. *drummondii* (Müll. Arg.) Grüning, placed above in the synonymy of *B. lechenaultii*, are applicable to this variant.

Selected specimens examined: **Western Australia.** Beaufort Inlet, Feb 1964, *Newbey 1245* (PERTH); junction of Twertup Creek & Fitzgerald River, Fitzgerald River N.P., Aug 1985, *Newbey 10946* (BRI, PERTH); inlet S of Fitzgerald, Jul 1971, *Aplin 4787* (PERTH); Phillips River, 19 km from Ravensthorpe on Ravensthorpe – Albany road, Oct 1966, *Muir 4150* (MEL); 30 km SW of Ravensthorpe, Oct 1986, *Newbey 11231* (PERTH); Quoin Head Campground, Fitzgerald River N.P., W of Hopetoun, Nov 1996, *Lepschi BJL3194* & *Lally* (BRI, MEL); Fitzgerald River N.P., c. 50 m NW of Quoin Head campsite, Apr 2001, *Hislop 2204* (BRI); Fitzgerald River, Sep 1948, *Gardner 9251* (PERTH); Coppermine Creek, Fitzgerald River N.P., Oct 1970, *Royce 9291* (PERTH); Oldfield River at crossing of the Esperance – Ravensthorpe road, c. 105 km W of Ravensthorpe, Oct 1968, *Eichler 20225, 20226* (PERTH).

4. *Beyeria opaca* F. Muell., *Trans. Philos. Soc. Victoria* 1: 16 (1855); *Beyeria opaca* F. Muell. var. *opaca*, Benth., *Fl. Austral.* 6: 65 (1873). **Type:** [Victoria.] Murray, *s.d.*, *F. Mueller s.n.* (lecto [here chosen]: MEL 2062921; isolecto: K).

Beyeria opaca var. *latifolia* J.M. Black, *Fl. S. Austral.*, 1st edn, 357 (1924). **Type:** [South Australia.] Ooldea, January 1917, *s.coll.* (holo: AD 98046056; iso: AD 966050860).

Beyeria opaca var. *typica* Grüning in A. Engler, *Pflanzenr.* H58: 69 (1913), *nom. inval.* [ICBN, Art. 24.3].

Illustrations: Cunningham *et al.* (1982: 453); Weber (1986: 742, fig. 398b); Jeanes (1999: 67, fig. 10i); Corrick & Führer (2000: 81).

Dioecious, spreading, much-branched **shrubs** to 1 m high, resinous on most parts. Young branchlets pale green and angular becoming terete with age, glabrous; older branchlets with grey to black bark. **Leaves** petiolate; petioles 1–1.5 mm long, glabrous, glands absent; blades narrow-obovate, 7–20 mm long, 1.2–4 mm wide, length:width ratio 5–8:1; adaxial surface glabrous and ± smooth, resinous; abaxial surface papillose and hairy with ± sessile, stellate hairs *c.* 0.05 mm across (obscured by resinous covering); base cuneate; margins ± flat or slightly recurved; apex rounded; midvein faintly impressed adaxially, abaxially faintly raised, glabrous and resinous; secondary and tertiary veins obscure; marginal glands occasionally present at base of blade, 1 per side of midrib, sessile, smooth, *c.* 0.1 mm across. **Flowers** pedicellate, males axillary, solitary, females axillary or terminal on short axillary branchlet, solitary; bracts ± triangular, 1.3–1.5 mm long, acute at apex, glabrous; pedicels ± glabrous, stouter on female flowers than on male flowers; calyx lobes 5, glabrous, concavo-convex, acute to rounded at apex; petals absent in male flowers, absent or rudimentary in female flowers; disc obscure or absent. **Male flowers** with pedicels 4–7 mm long; calyx lobes yellowish green, reddened in parts, suborbicular or ovate, 1.5–3.5 mm long, 2–2.8 mm wide, the margin erose; receptacle 1–1.5 mm across, glabrous; stamens 25–40; filaments erect, 0.8–1 mm long, glabrous; anthers 0.7–0.9 mm long. **Female flowers** with pedicels 1.5–4 mm long; calyx lobes green, ± appressed to and enclosing gynoeceum apart from stigma, ovate, 0.9–1.8 mm long, 0.7–1.5 mm wide, the margin entire; petals when present, oblong, < 0.2 mm long; ovary ellipsoid, 0.8–1 mm long, glabrous or densely hairy distally, 2-locular; style ± obsolete; stigma calyptriform, *c.* 1 mm across, shallowly umbilicate, glabrous, with margins ± entire. **Fruits** ellipsoid, laterally compressed, 4.5–8.5 mm long, 3.7–7 mm across, 2.5–4.5 mm in thickness, 1- or 2-seeded, glabrous, ± smooth; persistent calyx *c.* one fifth the length of mature fruit. **Seeds**

ellipsoid, dorsi-ventrally compressed, 3.5–5 mm long (including caruncle), 2.2–3 mm across, 2–2.7 mm in thickness; testa mottled light to dark brown; caruncle *c.* 1 mm long and 1.5 mm wide, creamy-white.

Additional selected specimens examined: **Western Australia.** *c.* 50 m SW of Bushfire Rock road, 46.5 km E of Hyden, Sep 1991, *Mollemans & Mollemans 4624* (BRI); 76.9 km E of Norseman on Eyre Highway, Aug 1995, *Cranfield 10049* (BRI, PERTH). **South Australia.** 1 mile [*c.* 1.6 km] S of Maralinga, Aug 1956, *Forde 466* (MEL); Lake Tallacootra, Oct 1983, *Weber 8191* (BRI); 30.5 miles [*c.* 49 km] from Whyalla towards Kimba, Aug 1968, *Canning 2174* (CANB, NSW); 18 km W of Walker Flat, Sep 1979, *Spooner 6530* (AD, NSW); 26 km NE of Blanchetown on Waikerie road, Oct 1975, *Haegi 689* (AD); turnoff to Loxton, just before Alawoona on Alawoona to Paruna road, Oct 1989, *Henderson & Turpin H3320* (BRI); *c.* 9 km N of Overland Corner, Sep 1971, *Donner 3697* (AD, NSW). **Victoria.** *c.* 11.7 km along road which runs W of the Sunset Tank – Merrinee road, Sep 1980, *Short 1194 & Corrick* (AD, CANB, MEL, NSW); 3 km W of abandoned railway, near Rocket Lake, Oct 1977, *Crisp 3321* (CANB, MEL); 36 miles [*c.* 58 km] W of turnoff, 14 miles [*c.* 23 km] N of Birthday Tank, Sunset Country, Sep 1965, *Filson 7449* (AD, MEL, NSW); Kulkyne S.F., W of the old Calder Highway, 2 miles [*c.* 3 km] N of the Lake Hattah to Hattah Station road, Nov 1958, *Aston 152* (MEL); *c.* 15 km S of Hattah, heading towards Ouyen on Calder Highway, Sep 1989, *Henderson & Turpin H3268* (BRI); Big Desert, 44 km N of Broken Bucket bore, Oct 1979, *Corrick 6360* (MEL). **New South Wales.** 14 miles [*c.* 22 km] from Mt Hope to Euabalong, Sep 1969, *Dunlop 1554* (CANB); 26 miles [*c.* 42 km] from Lake Cargelligo towards Mt Hope, Sep 1966, *Phillips s.n.* (AD 97031105, CANB [CBG016390]); *c.* 22 km E of Rankins Springs, Oct 1972, *Jackson 2153* (AD, MEL); Pulletpop N.R., *c.* 20 km SW of Rankins Springs, Nov 1975, *Crisp 1454* (AD, CANB); *c.* 17 km S of Weethalle on Weethalle – Borellan road, Sep 1989, *Henderson & Turpin H3258* (BRI).

Distribution and habitat: *Beyeria opaca* occurs in southern Australia, from Whyalla, south-eastern South Australia, eastward to Weethalle and Lake Cargelligo, New South Wales and south to Swan Hill in Victoria, with disjunct populations near Hyden and Norseman in southern Western Australia and near Maralinga, Lake Tallacootra and the Gawler Range, south-western South Australia (**Map 5**). It grows in mallee communities on red sandy soils on sandy flats or dunefields.

Phenology: Flowers have been collected throughout the year, particularly from August to November, fruits in March, April and from June to November.

Affinities: *Beyeria opaca* resembles the narrow leaf forms of *B. viscosa* but can be distinguished by its smaller habit (shrub to 1 m high compared with shrub to small tree to 5 m high) and leaves (7–20 mm long × 1.2–4 mm wide compared with 20–90 mm long × 5–30 mm wide), 2-locular ovary, and generally fewer stamens in each male flower.

Typification: In the protologue of *Beyeria opaca*, Mueller (1855) did not cite any particular collection but listed a number of localities “In the Mallee scrub, between Lake Lalbert, Lake Tyrrell, and the Murray River”. Four collections which we consider part of the original material that Mueller used to draw up his description of this species have been located amongst material loaned to BRI from MEL and K. Two of the MEL sheets [114214 and 114225] are labelled “*Beyeria viscosa* var *opaca*, ‘Mallee Scrub’”. The other MEL sheet [206292], ex herb. Sonder and the K sheet are labelled “*Beyeria opaca*, Murray, Mueller”. The MEL sheet [206292] is chosen as the lectotype of this name because it is an ample specimen and has morphology that agrees with the description in the protologue.

5. *Beyeria subsecta* J.M.Black, *Fl. S. Austral.* 357–358 (1924). **Type:** [South Australia.] Cygnet River, Kangaroo Island, 20 October 1908, *H.H.D.Griffith s.n.* (holo: AD 9831247).

Illustration: Barker & Dashorst (1984: 139).

Dioecious, much-branched **shrubs** to 0.6 m high, resinous on most parts. Young branchlets of unknown colour when fresh, angular becoming terete with age, puberulous between resinous longitudinal ridges; hairs stellate, sessile, *c.* 0.1 mm across, sometimes obscure by resin; older branchlets with grey to black shallowly fissured bark. **Leaves** petiolate; petioles 0.5–1.5 mm long, glabrous, glands absent; blades linear or very narrow-obovate, 4–10 mm long, 0.8–1.6 mm wide, length:width ratio 5–7:1; adaxial surface glabrous and ± smooth, resinous; abaxial surface densely hairy with ± sessile, stellate hairs *c.* 0.1 mm across; base cuneate; margins recurved to midrib usually concealing abaxial leaf surface; apex obtuse to rounded, ultimately apiculate with extension from

midrib; apiculum slender, up to 0.4 mm long; midvein slightly impressed adaxially, abaxially raised, flattened, glabrous and resinous on abaxial face; secondary and tertiary veins obscure; marginal glands rarely present at base of blade, 1 per side of midrib, sessile, smooth, *c.* 0.1 mm across. **Flowers** pedicellate, axillary, solitary; bracts oblong, 0.6–1.2 mm long, acute at apex, ± glabrous; pedicels stellate pubescent, stouter on female flowers than on male flowers; calyx lobes 5 (rarely 4 in male flowers), ovate, ± flat, stellate-puberulous abaxially, glabrous adaxially, the margins entire; petals absent; disc a continuous ring, ± fleshy, glabrous. **Male flowers** with pedicels 1.5–3 mm long; calyx lobes light green to yellow or white, reddened in parts, 1.5–2.2 mm long, 1.2–1.4 mm wide, acute, obtuse or rounded at apex; receptacle *c.* 0.4 mm across, glabrous; stamens 15–25; filaments erect to spreading, 0.1–0.3 mm long, glabrous; anthers 0.4–0.6 mm long. **Female flowers** with pedicels up to 1 mm long; calyx lobes green, ± appressed to and enclosing gynoecium apart from stigma, 1.6–2.1 mm long, 0.7–0.8 mm wide, acute at apex; ovary ellipsoid, dorsio-ventrally compressed, *c.* 1 mm long, sparsely to densely stellate-puberulous (usually obscured by resinous covering), 2-locular; style *c.* 0.4 mm long, sparsely to densely stellate puberulous (usually obscured by resinous covering); stigma bipartite; lobes ± oblong, *c.* 1 mm long, glabrous, appressed to ovary, with margins entire. **Fruits** ellipsoid, *c.* 3 mm long and 2.5 mm across, 1-seeded, sparsely stellate hairy distally; persistent calyx *c.* half the length of mature fruit. Seed not seen.

Additional specimens examined: South Australia, along side of road heading ENE towards Point Morrison near junction with Kingscote to Penneshaw road, Oct 1983, *Davies & Bushman 15* (MEL); *Beyeria* N.P., Kangaroo Island, Apr 1991, *Spencer 1057 & Worboys* (MEL); 700 m S of six way road intersection, 12.5 km SE of Cygnet River township on Kingscote to Penneshaw road, Oct 1983, *Davies & Bushman 9* (BRI, CANB); 700 m ENE of road intersection NE of Dead Horse Lagoon, Kangaroo Island, Oct 1983, *Davies & Bushman 4* (CANB); road junction 2.3 km NW of intersection N of Kiowie Station on Kingscote to Penneshaw road, Oct 1983, *Davies & Bushman 2* (MEL); 5 miles [*c.* 8 km] from American River, towards Kingscote, Kangaroo Island, Sep 1965, *Phillips SA/65 776* (CANB); proposed American River Tip, top of Muston Hill, 9.7 km E of American River, Aug 1984, *Weston 92* (CANB).

Distribution and habitat: *Beyeria subsecta* is endemic to Kangaroo Island, South Australia (Map 6). It grows in *Eucalyptus cneorifolia* and *Melaleuca uncinata* heathland and mallee on clay on a laterite substrate and in *Casuarina* shrubland and mallee on white sand with ironstone over clay intruded with limestone.

Phenology: Flowers have been collected from August to October, fruits in October.

Affinities: *Beyeria subsecta* is morphologically most similar to *B. lechenaultii* but differs in having generally smaller leaves (4–10 mm long × 0.8–1.6 mm wide compared with 9–40 mm long × 0.9–15 mm wide) and fruits (*c.* 3 mm long and 2.5 mm across compared with 4.5–8 mm long × 3.8–7 mm across), and female flowers with a bipartite rather than an entire stigma.

Notes: *Beyeria subsecta* is listed as 'Vulnerable' in the South Australian threatened species list under the *National Parks and Wildlife Act (South Australia) 1972*.

6. *Beyeria viscosa* Miq., *Ann. Sci. Nat. Bot.* ser. 3, 1: 350–352, *t.* 15 (1844); *Beyeria viscosa* Miq. var. *viscosa*, Müll.Arg. in A.DC., *Prodr.* 5(2): 202 (1866). **Type:** [Western Australia] in colliculis arenosis insulae Rottenest, N.Holl., 19 August 1839, *L. Preiss 2387* (holo: U 19718; iso: G-DC *n.v.* [microfiche IDC 800-73. 2454: III. 1], LD 99/018-0879, MEL [3 sheets 2062937 ex Sonder Herb., 2062918 ex Sonder Herb., 114267 ex Steetz Herb.], P 275782).

Beyeria viscosa var. *amoena* Müll.Arg. in A.DC., *Prodr.* 15(2): 202 (1866). **Type:** southern Australia, 1863, *F. Mueller s.n.* (lecto [here chosen]: G-DC *n.v.* [microfiche IDC 800-73. 2454: III. 7]; iso?: K).

Beyeria viscosa var. *latifolia* Benth., *Fl. Austral.* 6: 65 (1873). **Type:** Western Australia. Swan River to Cape Richer [Riche], *s.d.*, *J. Drummond 5th coll. n. 217* (holo: K [ex herb. Benth.]; iso: K [ex herb. Hook.]).

Beyeria viscosa var. *minor* Müll.Arg. in A.DC., *Prodr.* 5(2): 202 (1866). **Type:** [New South Wales.] interior west from Wellington Valley, 1825, *A.C. Cunningham s.n.* (holo: G-DC *n.v.* [microfiche IDC 800-73. 2454: III. 6]).

Calyptrostigma oblongifolium Klotzsch in J.G.C. Lehmann, *Pl. Preiss.* 1(2): 176 (1845); *Beyeria oblongifolia* (Klotzsch) Sond., *Linnaea* 28: 564 (1857); *Beyeria viscosa* var. *oblongifolia* (Klotzsch) Müll. Arg. in A. DC., *Prodr.* 15(2): 202 (1866). **Syntypes:** [Australia.] Nova Hollandia, *s.d.*, *s.coll.* (B-Willd. 17848 fol. 1 *n.v.* [microfiche IDC 7440. 1291: III. 4]); *s.loc.*, *s.d.*, *Labillardière s.n.* (B-Willd. 17849 fol. 1 and 2. *n.v.* [microfiche IDC 7440. 1291: III. 6,7]).

Croton viscosus Labill., *Nov. Holl. Pl.* 2: 72–73, t. 222 (1806), ('*viscosum*'); *Calyptrostigma viscosum* (Labill.) Klotzsch in J.G.C. Lehmann, *Pl. Preiss.* 1(2): 176 (1845). **Type:** [Australia.] Nova Hollandia, ora austro-occidentalis, *s.d.*, *Labillardière s.n.* (lecto [here chosen]: FI 165908 *n.v.* [transparency at BRI]).

Beyeria viscosa var. *obovata* C.T. White, *Proc. Roy. Soc. Queensland* 50: 86 (1939). **Type:** Queensland. MITCHELL DISTRICT. Torrens Creek, 19 March 1933, *C.T. White 8731* (holo: BRI; iso: A *n.v.*, BRI, K *n.v.*).

Beyeria preissii Sond., *Linnaea* 28: 564 (1857) *nom. superfl.* **Type:** [Western Australia.] *s.loc.* [s.d. in sandy hills on Rottneet Island, 19 August 1839], [*J.A.L.*] *Preiss 2387* (lecto (here chosen): MEL 2062918 ex Sonder Herb.; isolecto: LD 99/018-0879, MEL [2 sheets 2062937 ex Sonder Herb., 114267 ex Steetz Herb.], G-DC *n.v.* [microfiche IDC 800-73. 2454: III. 1], P 275782, U 19718).

Beyeria viscosa var. *genuina* Müll. Arg. in A. DC., *Prodr.* 15(2): 202 (1866), *nom. inval.* [ICBN, Art. 24.3].

Illustrations: Cunningham *et al.* (1982: 453); Rippey & Rowland (1995: 107); Jeanes (1999: 67, fig. 10j).

Dioecious or rarely monoecious, dense rounded or slender **shrubs or rarely small trees** to 5 m high, usually resinous on young shoots, buds and adaxial surface of leaf. Main trunk with flaky, grey bark. Young branchlets of unknown colour in fresh state, angular becoming ± terete with age, densely hairy with minute appressed hairs (obscured by resinous covering); older branches with grey, ± smooth or shallowly fissured bark. **Leaves** petiolate; petioles 3–6 mm long, glabrous, 6 or 7 pairs of

sessile glands on adaxial face; blades narrow-elliptic to elliptic, oblong elliptic, narrow-obovate to obovate, 20–90 mm long, 5–30 mm wide, length:width ratio 3–7:1; adaxial surface glabrous and smooth; abaxial surface hairy with stellate hairs *c.* 0.1 mm across, usually covered with resin; base obtuse to cuneate or attenuate; margins flat or slightly recurved; apex rounded, obtuse, acute or rarely retuse to emarginate; midvein impressed adaxially, abaxially prominently raised, rounded and glabrous; secondary and tertiary veins obscure or slightly impressed adaxially, obscure or visible abaxially; marginal glands absent. **Flowers** pedicellate, males axillary, solitary or in shortly pedunculate racemose clusters of up to 5 flowers, females axillary or terminal on short axillary branchlet, solitary or rarely in shortly pedunculate lax clusters of up to 3 flowers; peduncles up to 2–4 mm long, glabrous or if puberulous, then indumentum usually concealed by resinous covering; bracts oblong, 1–3 mm long, rounded at apex, glabrous; pedicels angular, puberulous, indumentum usually concealed by resinous covering, stouter on female flowers than on male flowers; calyx lobes 5 (rarely 4 or 6), pale green, glabrous or puberulous and usually concealed by resinous covering; petals absent; disc obscure, absent or ± a continuous ring. **Male flowers** with pedicels 3–10 mm long; calyx lobes oblong, ovate, broad-ovate or suborbicular, 2.8–5.2 mm long, 2.6–4 mm wide, concavo-convex, the margins erose, obtuse to rounded at apex; receptacle *c.* 2 mm across, glabrous or hairy; stamens 30–70; filaments ± erect, 0.5–1.8 mm long, glabrous or rarely with scattered hairs proximally, entire; anthers 0.9–2 mm long. **Female flowers** with pedicels 5–20 mm long; calyx lobes ± appressed to and enclosing gynoecium apart from stigma, oblong or suborbicular, 2.2–3 mm long, 1.5–2.3 mm wide, plano-convex, the margins entire, rounded to obtuse at apex; ovary subglobose, ± trigonal, 1–2.6 mm long, glabrous, thickly resinous, 3-locular; style obsolete, < 0.1 mm long; stigma calyptriform, 1.8–2 mm across, glabrous, with margins erose. **Fruits** globose, weakly to strongly trilobate, green or purple, 6–8 mm long, 6–8.5 (–10) mm across, 3-seeded, glabrous or rarely with scattered

stellate hairs, resinous, smooth; persistent calyx *c.* one third the length of mature fruit. **Seeds** ellipsoid, dorsi-ventrally compressed, 4.5–7.2 mm long (including caruncle), 2.6–4 mm across, 1.9–3.5 mm in thickness; testa light brown, brown to reddish brown, usually mottled; caruncle 1–2 mm long, 1.5–2 mm wide, yellowish-white.

Additional selected specimens examined: **Western Australia.** near S end of Useless Harbour in Sharks Bay, 1863, *Brown s.n.* (MEL 114268); East Wallabi Island [Houtman Abrolhos], Jul 1970, *Ashby 3263* (PERTH); Garden Island, Sep 1978, *Marchant s.n.* (PERTH 06845983); near upper carpark, Bunker Bay, Cape Naturaliste, WNW of Busselton, Sep 1988, *Henderson H3200* (BRI); SE peninsula, Middle Island, Recherche Archipelago, Nov 1973, *Weston 8791 & Trudgen* (CANB, PERTH). **South Australia.** Boston Point, Eyre Peninsula, [in 1851?,] *Wilhelm s.n.* (MEL 2065872). **Queensland.** NORTH KENNEDY DISTRICT. Sally's Mesa, 34 km from Greenvale on Charters Towers road, Feb 1994, *Forster PIF14975 & Bean* (BRI). MITCHELL DISTRICT. 41 km NW of Torrens Creek, Apr 1993, *Thompson HUG410 et al.* (BRI). LEICHHARDT DISTRICT. Little St Peter, 10 miles [*c.* 16 km] N of Springsure, Sep 1985, *O'Keefe 781* (BRI, CANB). DARLING DOWNS DISTRICT. Dunmore S.F., 49.3 km WSW of Dalby, Apr 1995, *Halford Q2488* (BRI). **New South Wales.** MacIntyre Falls, 35.2 km NW of Ashford on the Wallangarra road, Mar 1987, *Coveny 12517 et al.* (BRI, NSW); *c.* 6 km N of Cobar on road to Bourke, Oct 1989, *Henderson & Turpin H3367* (BRI, NSW); Mt Wombelong, Warrumbungle Ranges, Dec 1973, *Streimann HS550* (AD, BRI, CANB); Bungonia Gorge, S of Marulan, Nov 1966, *Pullen 4166* (BRI, MEL, NSW); The Rock NR, 30 km SW of Wagga Wagga, Nov 1975, *Crisp 1835* (AD, BRI, NSW); Erskine Creek, Nepean River, Sep 1888, *Maiden s.n.* (NSW 463865). **Victoria.** Sorrento, Nov 1903, *Weindorfer s.n.* (MEL 114270). **Tasmania.** 10 miles [*c.* 16 km] from Launceston, Jan 1949, *Burbidge 2941* (CANB, HO); St Pauls River E of Cutoff Hill, May 1985, *Collier 519* (HO); Longley, beside North West Bay River, Jan 1989, *Davies 782 & Ollershaw* (BRI, MEL); above old quarry on Mystery Caves track, Jan 1983, *Forbes 1334* (CANB, HO, MEL).

Distribution and habitat: *Beyeria viscosa* has a disjunct distribution occurring in western and eastern Australia (**Map 7**). In south-western Western Australia it occurs in scattered populations in coastal areas from Shark Bay south to Yallingup and on the south coast in the Archipelago of the Recherche near Esperance. It grows in heathland and shrubland communities in sandy soils over limestone or rarely on sandy clay soils over granite. There is a single record (*George 14178* (PERTH)) from a slope near a creek in Jarrah/Marri forest on sandy loam over laterite.

In eastern Australia it occurs in subcoastal and inland areas from Ingham, north-eastern Queensland south to the southern coast of New South Wales, Flinders Island, eastern Tasmania, and single collections from Boston Point, Eyre Peninsula, South Australia, and Sorrento, Victoria. In inland areas it grows mostly in mallee or *Eucalyptus* woodland communities, in skeletal sandy loams or red earths, in gullies, on ridges, rocky slopes and hilltops. In subcoastal areas it grows in mostly *Eucalyptus* dominated open forests in gullies, along river banks and on gentle slopes.

Phenology: Flowers have been recorded throughout the year, particularly from June to January, fruits in August to November.

Typification: In the protologue of *Croton viscosus*, Labillardière (1806) did not cite any particular collection but made the statement “Habitat in terra Van-Leuwin”. The location cited in the protologue refers to the area around the present town of Esperance and Esperance Bay, Western Australia (Nelson 1974, 1975). Labillardière made botanical collections in this area in 1792 as well as in Tasmania while a member of D’Entrecasteaux’s expedition. Labillardière’s Herbarium now resides in Florence (FI-WEBB). On our behalf Alex Chapman, while Australian Botanical Liaison Officer at K, visited FI and searched for relevant type material. We have seen photographs of two specimens from Labillardière’s Herbarium, namely sheets stamped with Herbarium Webbianum numbers 165908 and 165910. The sheet numbered 165908 has pinned to it a printed label “Herbarium Webbianum, ex Herb. Labillardière” with the hand written annotation ‘Nova Hollandia, ora austro-occidentalis’, two pages with a handwritten draft of the description that appeared in the protologue of *Croton viscosus* and three small slips of paper with handwritten notes mostly of which are indecipherable. The four specimens that are attached to the sheet all appear to be part of a single collection, although three bear female flowers or fruit and the other bears male flowers. The sheet numbered 165910 has a printed label “Herbarium Webbianum, ex Herb. Labillardière” with the annotation ‘Nova Hollandia et terra Dieman’ and three small slips of paper with handwritten notes that

are mostly indecipherable. The four specimens that are attached to the sheet appear to be from two separate collections. The sheet numbered 165908 is here selected a lectotype for the name *Croton viscosus* as it is part of the original material and has morphology that agrees with the description in the protologue.

Müller (1866) cited two collections in his protologue of *Beyeria viscosa* var. *amoena* namely “In Nova Hollandia in monte Flinders (hb. Hook!)” and “in Australia Felice (Ferd. Muell. in hb. DC.)”. The collection in the Hooker herbarium has not been located in material on loan from Kew of this genus. The collection in G-DC is selected here as lectotype of this name.

Affinities: *Beyeria viscosa* is morphologically similar to *B. lanceolata* and *B. lasiocarpa*. It differs from *B. lanceolata* in having narrow-elliptic to obovate rather than lanceolate leaf blades and smaller globose fruit (6–8 mm long compared with 10–12 mm long). *Beyeria viscosa* differs from *B. lasiocarpa* by having glabrous (rather than densely hairy) ovaries and fruits and a resinous abaxial surface of its leaf blades.

Notes: The combination *Beyeria oblongifolia* was also made by J.D. Hooker in December 1857, four months after Sonder’s.

In his protologue of *Beyeria viscosa*, Miquel listed “*Croton viscosum* Labillard.?” This doubtful inclusion of Labillardière’s name has led many authors to presume that Miquel had made a new combination and therefore ascribe the authorship of the name *B. viscosa* as (Labill.) Miq. However, Miquel made the statement in the protologue of *B. viscosa* that no specimen of *Croton viscosus* Labill. was available to him and it had not been possible to confirm that *Croton viscosus* Labill. was the same as his species. We contend that this clearly indicates that Miquel was not transferring Labillardière’s name but publishing a new name for which Miquel should be attributed the sole authorship.

This species as circumscribed here varies considerably in the shape, length and width of its leaf blades. This variation has led several authors in the past to describe a number of infraspecific and specific taxa (Müller 1866;

Bentham 1873; White 1939). Much more material has since been collected and although the extreme forms within this species differ considerably, much of the morphological variation appears to intergrade especially with the variants in eastern Australia, making it difficult to assign material unequivocally to one or other of them. For this reason we have not formally recognised any variants here. However, the more notable variants are discussed below.

In Western Australia, specimens typically have large (30–70 mm long, 10–30 mm wide) leaves that are narrow-elliptic to elliptic or rarely narrow-obovate and 2.2 to 3.5 times as long as wide, obtuse to cuneate leaf bases, rounded to obtuse leaf apices, secondary and tertiary veins visible on abaxial surface of leaves, and a glabrous receptacle in male flowers. This variant includes the type of the name *Beyeria viscosa* Miq.

In Tasmania and Victoria, specimens have leaves that are generally narrower and more attenuate (40–90 mm long, 8–18 mm wide) and 3–5 times as long as wide, cuneate leaf bases, obtuse to acute leaf apices, secondary and tertiary veins obscure or faintly visible on abaxial surface of leaves, and a glabrous or sparsely hairy receptacle in male flowers.

In southern Queensland and New South Wales, specimens have typically smaller (20–50 mm long, 4–10 mm wide) leaves that are narrow-obovate and 3 to 6 times as long as wide, cuneate leaf bases, rounded to obtuse or rarely retuse leaf apices, secondary and tertiary veins obscure on abaxial leaf surface of leaves and densely hairy receptacle in male flowers. In the more mesic habitats in Central and South Coast, and Southern Tablelands of New South Wales, the leaves of this variant are generally broader and longer (50–70 mm long, 15–20 mm wide) than populations in drier habitats.

In northern Queensland, specimens have typically smaller (20–55 mm long, 10–30 mm wide) narrow-obovate to obovate leaves that 1.8 to 3 times as long as wide, cuneate to attenuate leaf bases, rounded to retuse or emarginate leaf apices, secondary and tertiary veins obscure on abaxial surface of leaves and a densely hairy receptacle in male flowers.

Beyeria sect. **Beyeriopsis** (Müll.Arg.) Benth., Fl. Austral. 6: 63, 66 (1873); *Beyeriopsis* Müll. Arg., *Linnaea* 34: 56 (1865). **Type:** *B. brevifolia* (Müll.Arg.) Benth.

Shrubs. **Flowers** petalous, slightly shorter than or equal to calyx lobes. **Male flowers** calyx lobes ± erect enclosing or appressed to androecium at anthesis; receptacle flat to convex; filaments entire or bifid distally; anthers of two separate, obloid, parallel but

contiguous cells, each transverse on the apex of the filament; connective extending beyond anther cells. **Female flowers** with stigmas calyptriform, discoid or shallowly 3-lobulate.

Distribution: The species of *Beyeria* sect. *Beyeriopsis* are confined to south-western Western Australia.

Key to species of *Beyeria* sect. *Beyeriopsis*

- | | | |
|-----|---|----------------------------|
| 1 | Young branchlets hairy | 2 |
| 1. | Young branchlets glabrous | 9 |
| 2 | Young branchlets densely hairy between glabrous longitudinal ridges; calyx lobes prominently keeled abaxially | 12. B. constellata |
| 2. | Young branchlets evenly covered with a sparse to dense indumentum; calyx lobes rounded abaxially | 3 |
| 3 | Leaf blades > 5 mm wide | 16. B. latifolia |
| 3. | Leaf blades ≤ 5 mm wide | 4 |
| 4 | Young branchlets with a sparse to moderately dense indumentum of stellate hairs; rays of hairs spreading to ascending | 5 |
| 4. | Young branchlets with a sparse to dense indumentum of simple or bifid hairs; hairs ascending to erect | 6 |
| 5 | Pedicels ≤ 7 mm long | 10. B. cinerea |
| 5. | Pedicels > 7 mm long | 17. B. lepidopetala |
| 6 | Pedicels ≥ 5 mm long | 8. B. brevifolia |
| 6. | Pedicels < 5 mm long | 7 |
| 7 | Young branchlets resinous, sparsely hairy; hairs < 0.3 mm long; ovaries 3-locular | 11. B. cockertonii |
| 7. | Young branchlets non-resinous, moderately to densely hairy; hairs ≥ 0.3; ovaries 2-locular | 8 |
| 8 | Flowers pedicellate; pedicels 2–4 mm long; ovaries glabrous | 22. B. simplex |
| 8. | Flowers ± sessile; ovaries densely hairy | 24. B. villosa |
| 9 | Young branchlets longitudinally grooved | 10 |
| 9. | Young branchlets not longitudinally grooved | 15 |
| 10 | Fruiting calyces 4–7 mm long | 9. B. calycina |
| 10. | Fruiting calyces < 4 mm long | 11 |
| 11 | Leaf apices rounded or obtuse, without excurrent midrib | 12 |
| 11. | Leaf apices rounded, obtuse, acute to attenuate or truncate, ultimately terminated with excurrent midrib | 13 |
| 12 | Leaf blades < 6 mm long | 19. B. physaphylla |
| 12. | Leaf blades > 6 mm long | 20. B. rostellata |

- 13 Pedicels hairy proximally with minute erect glandular hairs *c.* 0.05 mm long **13. B. disciformis**
13. Pedicels glabrous 14
- 14 Calyx lobes of female flowers suborbicular to very broad-ovate, *c.* 2.5 mm long; fruiting calyces *c.* half of fruit length **18. B. minor**
14. Calyx lobes of female flowers broad-oblong or broad-obovate, 0.8–1.3 mm long; fruiting calyces < one third of fruit length **23. B. sulcata**
- 15 Leaf apices acute to obtuse, ultimately apiculate with extension from midrib 16
15. Leaf apices obtuse to rounded, without excurrent midrib 18
- 16 Branchlets and leaves non-resinous; leaf apices with slender apiculum, 0.3–0.6 mm long **7. B. apiculata**
16. Branchlets and leaves mostly thickly resinous; leaf apices with stout apiculum, up to 0.2 mm long 17
- 17 Leaf blades 1.4–2 mm wide, length:width ratio < 10; leaf apices rounded **15. B. lapidicola**
17. Leaf blades 0.9–1.5 mm wide, length:width ratio 10–20; leaf apices acute to attenuate. **23. B. sulcata**
- 18 Adaxial surface of leaf blades smooth, non-resinous. **8. B. brevifolia**
18. Adaxial surface of leaf blades papillose, tuberculate, usually resinous 19
- 19 Male flowers with pedicels 7–11 mm long; ovaries without horn-like appendages **15. B. lapidicola**
19. Male flowers with pedicels 0.5–4 mm long; ovaries crowned by 4–6 horn-like appendages; 20
- 20 Leaf blades 5–16 mm long; pedicels of male flowers 1–2 mm long; pedicels of female flowers 1–3 mm long; subapical appendage on fruit up to 1 mm long. **14. B. gardneri**
20. Leaf blades 20–50 mm long; pedicels of male flowers 2–3 mm long; pedicels of female flowers 5–10 mm long; subapical appendage on fruit up to 2 mm long. **21. B. similis**

7. *Beyeria apiculata* Halford & R.J.F.Hend. **species nova** *B. brevifolia* (Müll.Arg.) Benth. maxime affinis sed foliis sessilibus vel breviter petiolatis petiolis usque ad 0.5 mm longis non petiolis 1–2 mm longis, folii lamina plerumque longiore, 10–40 mm longa non 5–15 mm longa, et apiculato ad apicem, flore mare staminibus 9–11 non *c.* 30 et flore femineo ovario 3-loculato non 2-loculato distinguenda est. **Typus:** Western Australia. O'Briens Lookout, *c.* 12 km NW of Wongan Hills, 14 September 1988, *R.J.F.Henderson H3157* (holo: BRI; iso: MEL, PERTH, MO, distribuendi).

Monoecious, spreading **shrubs** to 1.5 m high, not resinous. Young branchlets pale green

and angular becoming reddish brown and terete with age, glabrous; older branchlets with grey to black shallowly fissured bark. **Leaves** sessile or shortly petiolate; petioles up to 0.5 mm long, glabrous; blades linear, 10–40 mm long, 1–1.3 mm wide, length:width ratio 10–30:1; adaxial surface glabrous and ± smooth; abaxial surface hairy with ± sessile, stellate hairs *c.* 0.1mm across, base cuneate; margins revolute to midrib concealing abaxial leaf surface; apex obtuse to acute, ultimately apiculate with extension from midrib; apiculum slender, 0.3–0.6 mm long, recurved; midvein obscure adaxially, abaxially raised, flattened and glabrous on abaxial face; secondary and tertiary veins obscure; marginal glands rarely present on

blade, up to 1 mm from blade base, 1 per side of midrib, sessile, smooth, *c.* 0.1 mm across. **Flowers** pedicellate, axillary, solitary or rarely 2 per axil; bracts \pm triangular or narrow-oblong, 0.4–1.5 mm long, acute at apex, \pm glabrous; pedicels \pm glabrous except for scattered minute erect hairs, stouter and longer on female flowers than on male flowers; calyx lobes 5, green, suborbicular, glabrous, concave adaxially, gibbose abaxially, the margins erose, rounded at apex; petals slightly shorter than or equal to calyx lobes, erect, suborbicular or depressed obovate, glabrous abaxially, sparsely to moderately villose adaxially, the margins erose distally; disc obscure or absent. **Male flowers** with pedicels 2–4 mm long; calyx lobes 1–1.3 mm long, 1–1.1 mm wide, surrounding androecium at anthesis; petals 0.5–0.6 mm long, 0.5–0.6 mm wide; receptacle 0.8–1 mm across, minutely hairy; stamens 9–11; filaments erect, 0.1–0.3 mm long, glabrous, bifid distally; anthers 0.2–0.3 mm long. **Female flowers** with pedicels 5–12 mm long; calyx lobes \pm appressed to and enclosing gynoecium apart from stigma, 1–1.3 mm long, 0.8–1.1 mm wide; petals marcescent, 1–1.3 mm long, 0.8–1 mm wide; ovary ellipsoid, trilobate, 0.6–1 mm long, glabrous, 3-locular; style \pm obsolete; stigma \pm discoid, 0.4–0.5 mm across, glabrous, with margins entire. **Fruits** subellipsoid, 3–4 mm long, 3.4–4 mm across, 1–3-seeded, glabrous, smooth; persistent calyx *c.* one third the length of mature fruit. **Seeds** ellipsoid, dorsio-ventrally compressed, 3.5–3.7 mm long (including caruncle), 1.9–2.1 mm across, 1.4–1.6 mm in thickness; testa light to dark brown; caruncle 0.6–0.8 mm long, 0.8–1.3 mm wide, light brown. **Fig. 2.**

Additional specimens examined: Western Australia. 6 miles [*c.* 10 km] from Three Springs, towards Arrino, Sep 1968, *Phillips WA/68 955* (CANB); TV Translator Hill, 13.5 km NE of township of Wongan Hills on Piawaning road, Oct 1984, *Kenneally 9344* (CANB, PERTH); E edge of the Wongan Hills, *c.* 15 km N of the township of Wongan Hills, Aug 1980, *Kenneally 7409* (PERTH).

Distribution and habitat: *Beyeria apiculata* occurs in south-western Western Australia where it is known from near Wongan Hills and Three Springs (**Map 8**). It is recorded as growing in a *Casuarina/Eucalyptus* woodland

community on shallow stony red loamy soil on a lateritic rise.

Phenology: Flowers have been collected from August to October, fruits in August and September.

Affinities: *B. apiculata* is morphologically most similar to *B. brevifolia* (Müll.Arg.) Benth. but can be distinguished by its more or less sessile to shortly petiolate leaves (petioles up to 0.5 mm long compared with petioles 1–2 mm long), generally longer leaf blades (10–40 mm long compared with 5–15 mm long), its apiculate leaf apex (rather than obtuse to rounded in *B. brevifolia*), fewer number of stamens per male flower (9–11 compared with *c.* 30) and its female flowers with a 3-locular rather than a 2-locular ovary.

Etymology: The specific epithet is from Latin *apiculatus*, ending abruptly in a short point, and refers to the apiculate apex of the leaf blades of this species.

8. Beyeria brevifolia (Müll.Arg.) Benth., *Fl. Austral.* 6: 67–68 (1873); *Beyeriopsis brevifolia* Müll.Arg., *Linnaea* 34: 58 (1865); *Beyeria brevifolia* (Müll.Arg.) Benth. var. *brevifolia*, Airy Shaw, *Kew Bull.* 26: 69 (1971). **Type:** [Western Australia.] Swan River, *s.d.*, [J.] Drummond *ser.* 4. n. 215 [holo: G-DC *n.v.* (microfiche IDC 800-73. 2454: II. 5); iso: K, PERTH].

Monoecious, erect, virgate **shrubs** to 1.8 m high, not resinous. Young branchlets reddish brown, \pm angular, glabrous or rarely sparsely to moderately hairy and glabrescent; hairs simple, erect to ascending, *c.* 0.1 mm long; older branchlets terete, with grey shallowly fissured bark. **Leaves** petiolate; petioles 1–2 mm long, glabrous; blades narrow-oblong to linear, 5–15 mm long, 0.8–1.6 mm wide, length:width ratio 6–12:1; adaxial surface glabrous and \pm smooth; abaxial surface hairy with \pm sessile, stellate hairs < 0.1 mm across; base cuneate; margins recurved or revolute to midrib concealing abaxial leaf surface; apex obtuse to rounded, straight or slightly recurved; midvein obscure adaxially, abaxially raised, flattened and glabrous on abaxial face; secondary and tertiary veins obscure; marginal glands absent. **Flowers** pedicellate, axillary or terminal on short

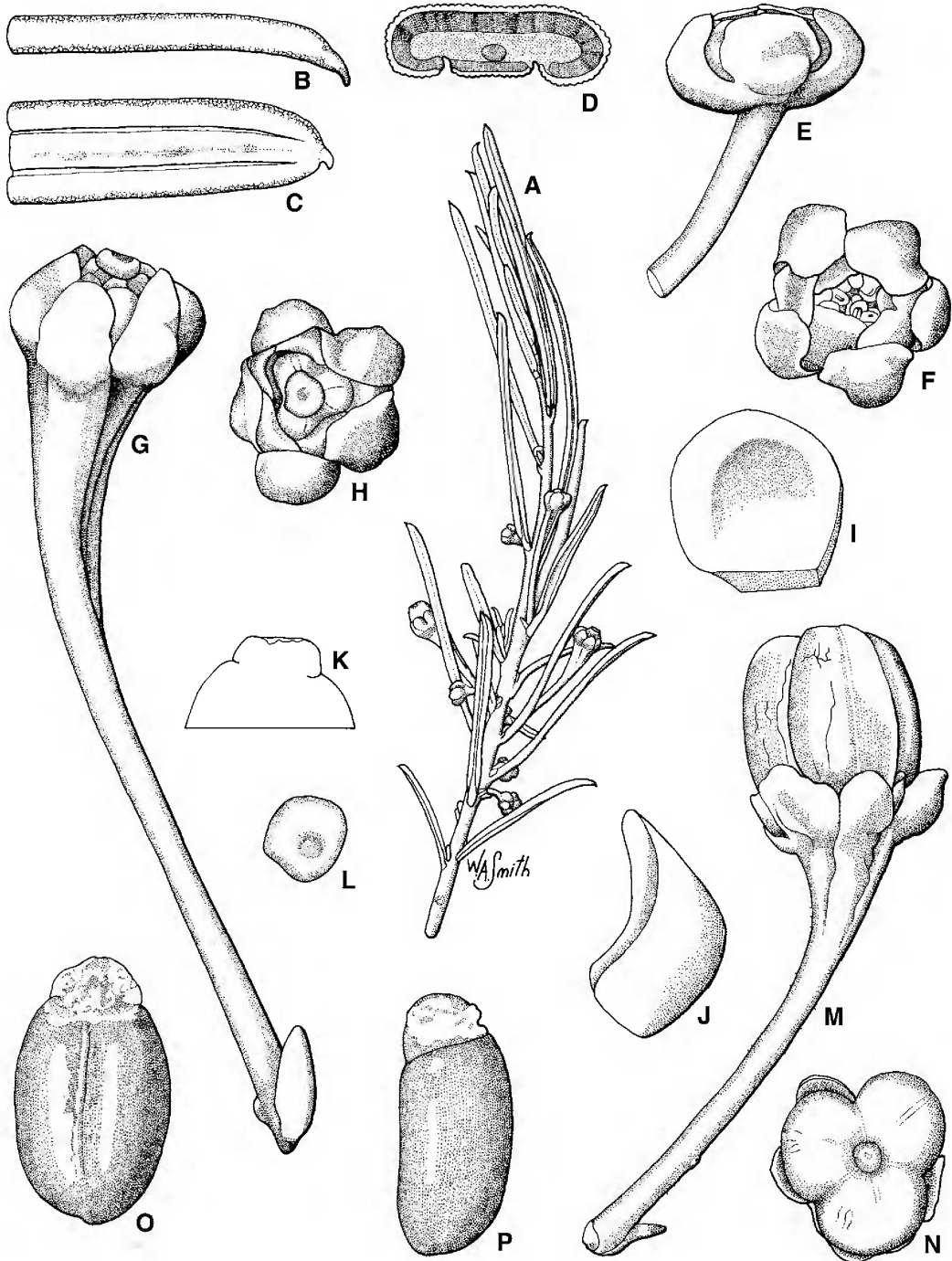


Fig. 2. *Beyeria apiculata*. A. branchlet with male and female flowers $\times 2$. B. side view of leaf apex $\times 12$. C. abaxial view of leaf apex $\times 12$. D. transverse section of leaf $\times 24$. E. side view of male flower $\times 15$. F. face view of male flower $\times 15$. G. side view of female flower $\times 12$. H. face view of female flower $\times 12$. I. adaxial view of calyx lobe from female flower $\times 24$. J. side view of calyx lobe from female flower $\times 24$. K. transverse section of stigma and distal half of ovary $\times 24$. L. face view of stigma $\times 24$. M. side view of fruit $\times 8$. N. face view of fruit $\times 8$. O. abaxial view of seed $\times 10$. P. side view of seed $\times 10$. A–P from *Henderson H3157* (BRI). Del. W. Smith.

axillary branchlets, solitary; bracts \pm triangular, up to 0.4 mm long, acute at apex, \pm glabrous; pedicels \pm glabrous, slightly stouter on female flowers than on male flowers; calyx lobes 5, yellowish green, suborbicular to very broad-ovate, glabrous, concavo-convex, the margins erose, rounded to broad-obtuse at apex; petals slightly shorter than calyx lobes, erect, depressed obovate, glabrous abaxially, sparsely to moderately villose adaxially distally, the margins erose distally; disc of 5 discrete glands; glands fleshy, glabrous. **Male flowers** with pedicels 5–15 mm long; calyx lobes 0.8–1 mm long, 0.9–1.1 mm wide, surrounding androecium at anthesis; petals 0.6–0.9 mm long, 0.5–1.4 mm wide; disc glands *c.* 0.3 mm long, \pm truncate or lobed distally, canaliculate adaxially; receptacle 1–1.3 mm across, glabrous; stamens 30; filaments erect, 0.1–0.3 mm long, glabrous, bifid distally; anthers *c.* 0.3 mm long. **Female flowers** with pedicels 7–13 mm long; calyx lobes \pm appressed to and enclosing gynoecium apart from stigma, 0.9–1.3 mm long, 0.8–1 mm wide; petals marcescent, 0.6–1 mm long, 0.6–1 mm wide; disc glands 0.4–0.6 mm long, concavo-convex, rounded, truncate or shallowly lobed at apex; ovary ellipsoid, 0.9–1.3 mm long, glabrous, 2-locular; style *c.* 0.1 mm long, glabrous; stigma calyptiform, 0.9–1.4 mm across, shallowly umbilicate, glabrous, with margins entire. **Fruits** broad-ovoid or obliquely ellipsoid, laterally compressed, 5–6.7 mm long, 3.4–6 mm across, 1- or 2-seeded, glabrous, smooth; persistent calyx *c.* one fifth the length of mature fruit. **Seeds** ellipsoid, dorsi-ventrally compressed, *c.* 5.2 mm long (including caruncle), 3.2 mm across and 2.7 mm in thickness; testa light to dark brown, shiny; caruncle *c.* 1.7 mm long and 2 mm wide, yellowish-brown.

Additional selected specimens examined: **Western Australia.** 5 km N of Nyabing, Sep 1979, *Crisp 6145 et al.* (BRI); NW slopes of Mt Short, *c.* 14 km NW of Ravensthorpe, Sep 1988, *Henderson H3188* (BRI); near NW base of Mt Short, *c.* 14 km NW of Ravensthorpe, Sep 1988, *Henderson H3189* (BRI); Mt Short, Sep 1968, *Wilson 7980* (PERTH); Ravensthorpe Shire, Hamersley Inlet Reserve, track to mouth of Hamersley Inlet, *c.* 500 m S of turnoff to CALM campsite, Aug 2001, *Hislop 2286* (BRI, PERTH); Mt Desmond, Aug 1964, *Gardner 14074* (PERTH); E side of Mt Desmond, Apr 1962, *George 3661* (PERTH); SW side of Mt Desmond, *c.* 10 km ESE of Ravensthorpe, Sep 1988, *Henderson H3191*

(BRI); 11 km ESE of Ravensthorpe, Oct 1966, *Muir 4217* (MEL); 8 km S of Ravensthorpe on road to Hopetoun, Aug 1968, *Wilson 7075* (PERTH); Mt Short, 10 miles [*c.* 16 km] N of Ravensthorpe, Nov 1968, *Wrigley s.n.* (CANB [CBG036514], PERTH); 77.5 miles [*c.* 124.7 km] N of Albany on Jerramungup road, Jan 1975, *Keighery 357* (PERTH); 2 miles [*c.* 3.2 km] from coast, E of Fitzgerald Inlet, Sep 1970, *Aplin 3706* (BRI, PERTH); Fitzgerald River, May 1964, *Gardner 14765* (PERTH); Mt Maxwell (Fitzgerald River N.P.), Sep 1985, *Newbey 10966* (BRI, PERTH).

Distribution and habitat: *Beyeria brevifolia* occurs in south-western Western Australia where it is known from near Jerramungup, north-eastwards to Mt Desmond near Ravensthorpe, with disjunct populations near Harrismith and Nyabing (**Map 9**). It grows in mallee communities with heath understorey, on gravelly, sandy loam or stony clay soils on hillsides and undulating sandy plains.

Phenology: Flowers have been collected in January, April, May and from August to November, fruits from August to October.

Affinities: *Beyeria brevifolia* is morphologically most similar to *B. apiculata*. For features distinguishing *B. brevifolia* from *B. apiculata*, refer to the 'Affinities' section under that species.

Notes: The collections from the disjunct populations at Harrismith and Nyabing (*Frizell & Morrison* (PERTH) from Harrismith and *Crisp 6145 et al.* (BRI) from Nyabing) differ from the other collections of this species examined by having a sparse to moderately dense indumentum of simple hairs on the young branchlets. Further collections and field studies are warranted to establish the significance of this difference.

9. Beyeria calycina Airy Shaw, *Kew Bull.* 26: 70 (1971); *Beyeria calycina* Airy Shaw var. *calycina*, Airy Shaw, *Kew Bull.* 26: 70 (1971). **Type:** Western Australia. Coolgardie District: 17 miles [*c.* 27 km] W of Lake King turnoff from Coolgardie – Esperance road, near granite outcrop, October 1963, *P.R. Jefferies 631018* (holo: PERTH; iso: PERTH, K).

Monoecious, spreading, much-branched **shrubs** to 1 (–1.5) m high, resinous on most parts. Young branchlets yellowish green, \pm angular, longitudinally grooved, glabrous, thickly resinous; older branchlets terete, with

grey to black shallowly fissured bark. **Leaves** petiolate; petioles 0.8–2 mm long, glabrous, minutely papillose (usually obscured by resinous covering); blades linear, 15–35 mm long, 2–3 mm wide, length:width ratio 7–12:1; adaxial surface ± glabrous, minutely papillose (obscured by thick resinous covering); abaxial surface densely hairy with ± sessile, stellate hairs *c.* 1 mm across; base cuneate or attenuate; margins recurved to midrib concealing abaxial leaf surface; apex obtuse to acute, ultimately apiculate with extension from midrib; apiculum stout, *c.* 0.3 mm long, bent upward; midvein slightly impressed adaxially, abaxially raised, flattened, glabrous and resinous on abaxial face; secondary and tertiary veins obscure; marginal glands present on blade, ± regularly spaced from base to apex of blade, up to 12 per side of midrib, sessile, smooth, *c.* 0.1 mm across. **Flowers** pedicellate, axillary, solitary; bracts ± ovate, 3–4 mm long, obtuse at apex, glabrous abaxially, stellate hairy adaxially; pedicels ± glabrous except for scattered minute erect hairs proximally, stouter on female flowers than on male flowers; calyx lobes 5, green, glabrous, rounded to obtuse at apex; petals ± equal in length to calyx lobes, erect, obovate, sparsely to moderately villose on both surfaces proximally, the margins erose distally; disc of 5 discrete glands; glands fleshy, *c.* 0.3 mm long, glabrous, dorsi-ventrally compressed. **Male flowers** with pedicels 3–4 mm long; calyx lobes suborbicular or very broad-ovate, 1.2–1.5 mm long, 1.5–2.5 mm wide, surrounding androecium at anthesis; petals *c.* 1.5 mm long and 1 mm wide; receptacle *c.* 1 mm across, minutely hairy; stamens 15–20; filaments erect, 0.2–0.6 mm long, glabrous, entire; anthers *c.* 0.5 mm long. **Female flowers** with pedicels *c.* 5 mm long; calyx lobes accrescent, appressed to and enclosing gynoecium apart from stigma, broad-obovate, 2–3.5 mm long (up to 7 mm long in fruit), 2.5–3 mm wide; petals marcescent, 2–2.5 mm long, 1.5–2 mm wide; ovary ellipsoid, trilobate, *c.* 1.5 mm long, glabrous, minutely papillose, 3-locular; style 0.6–1 mm long, glabrous; stigma discoid, *c.* 0.3 mm across, the same width as style, glabrous, with margins entire. **Fruits** broad-ellipsoid, *c.* 4.5 mm long, 4–4.5 mm across, 1–3-seeded, glabrous,

minutely papillose; persistent calyx longer than length of mature fruit. **Seeds** ellipsoid, dorsi-ventrally compressed, 3.5–4.2 mm long (including caruncle), 2–2.5 mm across, 1.5–1.8 mm in thickness; testa light to dark brown; caruncle 0.5–0.9 mm long, 1–1.4 mm wide, creamy-white.

Additional selected specimens examined: **Western Australia.** *c.* 27 km SW of Daniell, between Norseman and Salmon Gums, on road to Lake King, Sep 1988, *Henderson H3177* (BRI); 21 km W of Norseman – Esperance road, along Frank Hann road, Nov 1994, *Cranfield 9389* (BRI, PERTH); 14 miles [*c.* 22 km] W of junction of Norseman – Esperance and Lake King roads, May 1964, *Jefferies 640511* (PERTH); [without locality,] Oct 1961, *D.E. White s.n.* (PERTH).

Distribution and habitat: *Beyeria calycina* occurs in south-western Western Australia where it is known from between Norseman and Salmon Gums (**Map 10**). It grows in *Casuarina* shrubland with scattered mallee eucalypts and a shrubby layer on red brown sandy loam on undulating plains.

Phenology: Flowers have been collected in September and October, fruits in October.

Affinities: *Beyeria calycina*, *B. disciformis* Halford & R.J.F.Hend. and *B. minor* (Airy Shaw) Halford & R.J.F.Hend. are the only *Beyeria* species that have accrescent calyces. For features distinguishing *B. calycina* from those species, refer to the 'Affinities' section under the species concerned.

10. *Beyeria cinerea* (Müll.Arg.) Benth., *Fl. Austral.* 6: 66 (1873); *Beyeriopsis cinerea* Müll.Arg., *Linnaea* 34: 57 (1865). **Type:** [Western Australia.] in western New Holland at Swan River, *s.d.*, [*J.*] *Drummond 724* (holo: G-DC *n.v.* [microfiche IDC 800-73. 2454: II. 2]; iso: W *n.v.* [photo at BRI], K).

Diococious or sometimes monoecious, open, spreading, erect or prostrate **shrubs** to 0.7 m high, not resinous. Young branchlets of unknown colour when fresh, terete, sparsely to moderately hairy, glabrescent with age; hairs stellate, stipitate, up to 0.8 mm across; older branchlets with greyish white, shallowly fissured bark. **Leaves** petiolate; petioles 0.5–2.7 mm long, moderately hairy with indumentum as for branchlets; blades narrow-ovate to broad-ovate, narrow-elliptic or triangular, 3–17 mm long, 1.2–5 mm wide,

length:width ratio 2–4:1; adaxial surface sparsely hairy with stipitate stellate hairs *c.* 0.7 mm across, becoming glabrous with age though remaining sparsely tuberculate by persistent hair bases; abaxial surface densely hairy with sessile and stipitate stellate hairs up to 0.4 mm across; base cordate, cuneate to truncate; margin recurved or revolute sometimes to midrib concealing abaxial leaf surface; apex obtuse or acute; midvein obscure or faintly impressed adaxially, abaxially raised, moderately hairy with stellate hairs; secondary and tertiary venation obscure; marginal glands absent. **Flowers** pedicellate, axillary, males fasciculate in 2- or 3-flowered fascicles or solitary, females solitary; bracts ovate or oblong, 0.4–0.6 mm long, obtuse at tip, glabrous or with a few stellate hairs; pedicels slender, 1–3.5 (–7) mm long, glabrous or with a few stellate hairs; calyx lobes 5, yellow green to light green, concave and glabrous adaxially, gibbose with a few stipitate stellate hairs abaxially, the margins erose, obtuse to rounded at apex; petals slightly shorter than or equal to calyx lobes, erect, the margins erose; disc of 5 discrete glands; glands fleshy, 0.2–0.3 mm long, laterally compressed, glabrous, truncate to rounded or irregularly lobed. **Male flowers** with calyx lobes suborbicular to depressed ovate, 1–1.3 mm long, 1–1.6 mm wide, surrounding androecium at anthesis; petals suborbicular or depressed obovate, 0.5–0.8 mm long, 0.7–1 mm wide, glabrous abaxially, with scattered stellate hairs adaxially proximally; receptacle *c.* 1 mm across, stellate-tomentose; stamens 20–40; filaments erect, 0.2–0.5 mm long, glabrous, bifid distally; anthers 0.2–0.3 mm long. **Female flowers** with calyx lobes ± appressed to and enclosing gynoecium apart from stigma, suborbicular or broad-ovate, 0.7–1.1 mm long, 0.7–0.8 mm wide; petals suborbicular or transverse-elliptic, 0.3–0.6 mm long, 0.3–0.9 mm wide, glabrous abaxially, stellate-tomentose adaxially distally; ovary subglobose, 0.5–0.7 mm long, stellate-

pubescent or glabrous, mostly 1-locular by abortion, rarely 2-locular; style *c.* 0.2 mm long, stellate-pubescent; stigma ± discoid, 0.4–0.5 mm wide, glabrous, sulcate adaxially, with margins entire, slightly recurved. **Fruits** obliquely or transverse-pyriform, 4–6 mm long, 2.5–3.8 mm across, 1- or rarely 2-seeded, glabrous or with scattered stellate hairs; persistent calyx *c.* one fifth the length of mature fruit. **Seeds** globose or broad-ellipsoid, slightly dorsi-ventrally compressed, 2.9–4.5 mm long (including caruncle), 2–2.7 mm wide, 2–2.5 mm in thickness; testa mottled cream and dark brown; caruncle 0.7–1.7 mm long, 0.8–1.5 mm across, creamy-white to yellowish-white.

Affinities: *Beyeria cinerea* is morphologically most similar to *B. lepidopetala* F.Muell. but differs from that in having generally smaller leaves (3–17 mm long × 1.2–5 mm wide compared with 15–20 mm long × 1.5–3 mm wide) that are narrow-ovate to broad-ovate, narrow-elliptic or triangular rather than linear in outline and shorter pedicels (1–7 mm long compared with 8–30 mm long). *Beyeria cinerea* is also similar to *B. latifolia* Baill. but differs from it in having generally smaller leaves (3–17 mm long × 1.2–5 mm wide compared with 10–30 mm long × 6–12 mm wide) and smaller fruits (4–6 mm long × 2.5–3.8 mm across compared with 6–6.5 mm long × 4–5.5 mm across) that are more or less pyriform and 1-seeded rather than ovoid and 1–3-seeded.

Beyeria cinerea, as circumscribed here, occurs on the islands and in coastal areas from Exmouth to Mandurah, Western Australia. The species exhibits some discontinuous variation in leaf blade shape associated with a geographical disjunction. These differences are considered to be sufficient to warrant formal recognition of taxa at subspecific rank. Two subspecies are here formally described and they can be distinguished using the following key.

-
- Leaf blades with truncate to cuneate bases **10a. *B. cinerea* subsp. *cinerea***
 Leaf blades with cordate bases **10b. *B. cinerea* subsp. *borealis***

10a. *Beyeria cinerea* (Müll.Arg.) Benth. subsp. ***cinerea***

Beyeriopsis cygnorum Müll.Arg., *Linnaea* 34: 56–57 (1865); *Beyeria cygnorum* (Müll.Arg.) Benth., *Fl. Austral.* 6: 66 (1873). **Type:** [Western Australia.] Swan River, *s.d.*, [J.] Drummond 85 (holo: G-DC *n.v.* (microfiche IDC 800-73. 2454: I. 8); iso: MEL [2 sheets 114150, 114151], PERTH, K *n.v.* (photo at BRI)).

Leaves with petioles 1–2 mm long; leaf blades narrow-ovate to ovate or narrow-elliptic, 3.5–17 mm long, 1.2–5 mm wide; base cuneate to truncate; margins recurved or revolute; apex obtuse to acute.

Additional selected specimens examined: Western Australia. Horrocks Beach, Aug 1984, *Bates 3919* (AD); 15.8 km N of Leeman – Eneabba road, turnoff on Illawong road, Jul 1992, *Cranfield & Spencer 8260* (PERTH); Beehive Gully, Leeman, 1982, *Foulds 33* (PERTH); 3 miles [c. 5 km] E of Jurien Bay, Sep 1966, *George 7810* (PERTH); Parrot Ridge, Yancheep N.P., 50 km N of Perth, Sep 1989, *Keighery 11165* (CANB); Reabold Hill, Floreat Park, 8 km W [of] Perth, Nov 1987, *Keighery 9262* (PERTH); Buckland Hill, Mosman Park, Sept 1989, *Kenneally 11007* (PERTH); The Plains, Mandurah road, Oct 1967, *George 9202* (PERTH); Madora, Perth to Mandurah, Sep 1983, *Keighery s.n.* (PERTH).

Distribution and habitat: *Beyeria cinerea* subsp. *cinerea* occurs in south-western Western Australia where it is known from Horrocks Beach, south of Dongara, southward to near Mandurah (**Map 11**). It grows in coastal heath and shrubland communities on sandy soils over limestone.

Phenology: Flowers have been collected in July and from September to November, fruits from September to November.

Notes: The name *Beyeria cygnorum* which is here placed in synonymy is listed as Priority Three under DEC Conservation Codes for Western Australian Flora (Florabase, <http://florabase.dec.wa.gov.au> [accessed June 2008]).

10b. *Beyeria cinerea* subsp. ***borealis*** Halford & R.J.F.Hend. **subspecies nova** a *Beyeria cinerea* (Müll.Arg.) Benth. subsp. *cinerea* folii lamina generatim minore, 3–5.2 mm longa × 1.2–4.3 mm lata non 3.5–17 mm longa × 1.2–5 mm lata, basi laminae folii cordata

non truncata ad cuneata et marginibus folii laminae folii revolutioribus differt. **Typus:** Western Australia. N end of Passage Paddock, Dirk Hartog Island, 2 September 1972, *A.S.George 11384* (holo: PERTH; iso: BRI, CANB).

Beyeriopsis cyanescens Müll.Arg. in A.DC., *Prodr.* 15(2): 200 (1866); *Beyeria cyanescens* (Müll.Arg.) Benth., *Fl. Austral.* 6: 66–67 (1873). **Type citation:** “In Nova Hollandia, in Iles-Steriles (hb. Kunth! in hb. berol. ex Mus. Paris).” *n.v.*

Illustration: Grüning (1913: 74, fig. 12) as *Beyeria cyanescens*.

Leaves with petioles 0.5–2.5 mm long; blades triangular or narrow- to broad-ovate, 3–5.2 mm long, 1.2–4.3 mm wide; base cordate; margins revolute to midrib usually concealing abaxial surface of leaf blade; apex obtuse.

Additional selected specimens examined: Western Australia. E of Pitgrammunne Well on Yardie Creek Station, Cape Range, Sep 1964, *Chadwick 1434* (PERTH); ± 5 miles [c. 8 km] N of Yardie Creek, May 1965, *George s.n.* (PERTH); Learmonth road, 44 miles [c. 71 km] S of Bullara turnoff, Feb 1962, *George 3284* (PERTH); 5 miles [c. 8 km] N of Cardabia Station turnoff, Minilya – Exmouth road, Sep 1970, *George 10349* (PERTH); Bernier Island, Shark Bay, Jul 1988, *Morat 8104* (PERTH); Blow Hole, Carnarvon, Aug 1976, *Wittwer W1797* (PERTH); Dorre Island, Jul 1959, *Royce 5897, 5896* (PERTH); *ibid*, Aug 1977, *Weston 10566* (PERTH); Quoin Bluff area, Shark Bay, Jun 1974, *Kenneally 1345* (PERTH); Red Bluff, c. 3 km S of Kalbarri, May 1968, *Wilson 6507* (PERTH).

Distribution and habitat: *Beyeria cinerea* subsp. *borealis* is confined to coastal areas from Exmouth southwards to Kalbarri in Western Australia (**Map 12**). It grows in low scrub communities on red sandy soils on limestone rises.

Phenology: Flowers have been collected in February and from June to September, fruits in May, July and September.

Affinities: *Beyeria cinerea* subsp. *borealis* differs from *B. cinerea* subsp. *cinerea* by its generally smaller leaf blades (3–5.2 mm long × 1.2–4.3 mm wide compared with 3.5–17 mm long × 1.2–5 mm wide) which are cordate rather than truncate to cuneate at the base, and its more strongly revolute leaf blade margins.

Etymology: The subspecific epithet is from Latin, *borealis*, northern, in reference to this subspecies' distribution in relation to that of the other subspecies.

11. *Beyeria cockertonii* Halford & R.J.F.Hend., **species nova** *B. brevifoliae* (Müll.Arg.) Benth. maxime affinis sed strato viscido tenui in partibus maximis, habitu brevior (usque ad 0.25 m alto non usque ad 1.8 m alto), pedicellis brevioribus (1–3 mm longis non 5–15 mm longis) et flore femineo stigmatate 3-lobulato non calyptriformi et ovario 3-loculato non 2-loculato distinguenda est. **Typus:** Western Australia. SE of Ravensthorpe [precise locality withheld for conservation purposes], 5 September 2006, *D.Halford Q9139* & *G.Cockerton* (holo: PERTH; iso: BRI).

Beyeria sp. Bandalup Hill (G.Cockerton 7553), in Florabase, <http://florabase.dec.wa.gov.au> [accessed June 2008].

Monoecious, erect **shrubs** to 0.25 m high, resinous on most parts. Young branchlets yellow, ± angular, sparsely hairy; hairs simple, erect, *c.* 0.1 mm long; older branchlets terete, with grey irregularly tessellated bark. **Leaves** petiolate; petioles 0.5–1 mm long, glabrous; blades narrow-oblong to linear, 5–8 mm long, 0.8–1.2 mm wide, length:width ratio 6–9:1; adaxial surface glabrous and ± smooth; abaxial surface hairy with stellate hairs up to 0.5 mm across; base cuneate; margins recurved to midrib concealing abaxial leaf surface; apex rounded to truncate, slightly recurved; midvein obscure adaxially, abaxially raised, flattened and glabrous on abaxial face; secondary and tertiary veins obscure; marginal glands absent. **Flowers** pedicellate, axillary, solitary; bracts ± triangular, up to 0.4 mm long, acute at apex, glabrous; pedicels ± glabrous or with a few minute hairs proximally, slightly stouter on female flowers than on male flowers; calyx lobes 5, yellow, glabrous, concavo-convex, the margins erose; petals, erect, the margins erose distally; disc of 5 discrete glands; glands fleshy, glabrous. **Male flowers** with pedicels 1–3 mm long; calyx lobes suborbicular to very broad-ovate, *c.* 1.3 mm long and 1.2 mm wide, surrounding androecium at anthesis, rounded to broad-

obtuse at apex; petals slightly shorter than or equal to calyx lobes, depressed obovate, *c.* 0.8 mm long and 0.9 mm wide, glabrous abaxially, sparsely to moderately villose adaxially proximally; disc glands *c.* 0.2 mm long, ± truncate or lobed distally, canaliculate adaxially; receptacle 0.8–1.1 mm across, stellate hairy; stamens 10–16; filaments erect, *c.* 0.1 mm long, glabrous, entire or bifid distally; anthers *c.* 0.4 mm long. **Female flowers** with pedicels 1–1.5 mm long; calyx lobes ± appressed to and enclosing gynoecium apart from stigma, ovate to broad-ovate, *c.* 1.3 mm long and 0.8 mm wide, acute at apex; petals less than half the length of the calyx lobes, marcescent(?), broad-obovate, *c.* 0.4 mm long and 0.4 mm wide; disc glands *c.* 0.1 mm long, rounded to truncate at apex; ovary ellipsoid, *c.* 0.9 mm long, glabrous, 3-locular; style 0.1–0.3 mm long, glabrous; stigma 3-lobulate, glabrous; lobes erect, triangular, *c.* 0.2 mm long, with margins entire. **Fruits** ± ellipsoid, 3–4 mm long, 2–3 mm across, 1–3-seeded, glabrous, smooth; persistent calyx *c.* one third the length of mature fruit. **Seeds** ellipsoid, dorsi-ventrally compressed, *c.* 2.5 mm long (including caruncle), 1.5 mm across and *c.* 1 mm in thickness; testa dark brown; caruncle *c.* 0.5 mm long and 0.7 mm wide, pale brown. **Fig. 3.**

Additional specimens examined: Western Australia. [localities withheld] Feb 2003, *Landcare Services GC7553A* (PERTH); Jun 2002, *Cockerton GC7553* (BRI, PERTH).

Distribution and habitat: *Beyeria cockertonii* occurs in south-western Western Australia where it is known only from a single site near Ravensthorpe (**Map 13**). It grows in mallee-heath on shallow rocky clay soils on hill slopes and hilltops.

Phenology: Flowers have been collected in June and September.

Affinities: *Beyeria cockertonii* is morphologically most similar to *B. brevifolia* but can be distinguished by the thin, viscid covering over most parts, shorter habit (up to 0.25 m high compared with up to 1.8 m high), shorter pedicels (1–3 mm long compared with 5–15 mm long), and female flowers with a 3-lobulate rather than calyptriform stigma and a 3-locular rather than 2-locular ovary.

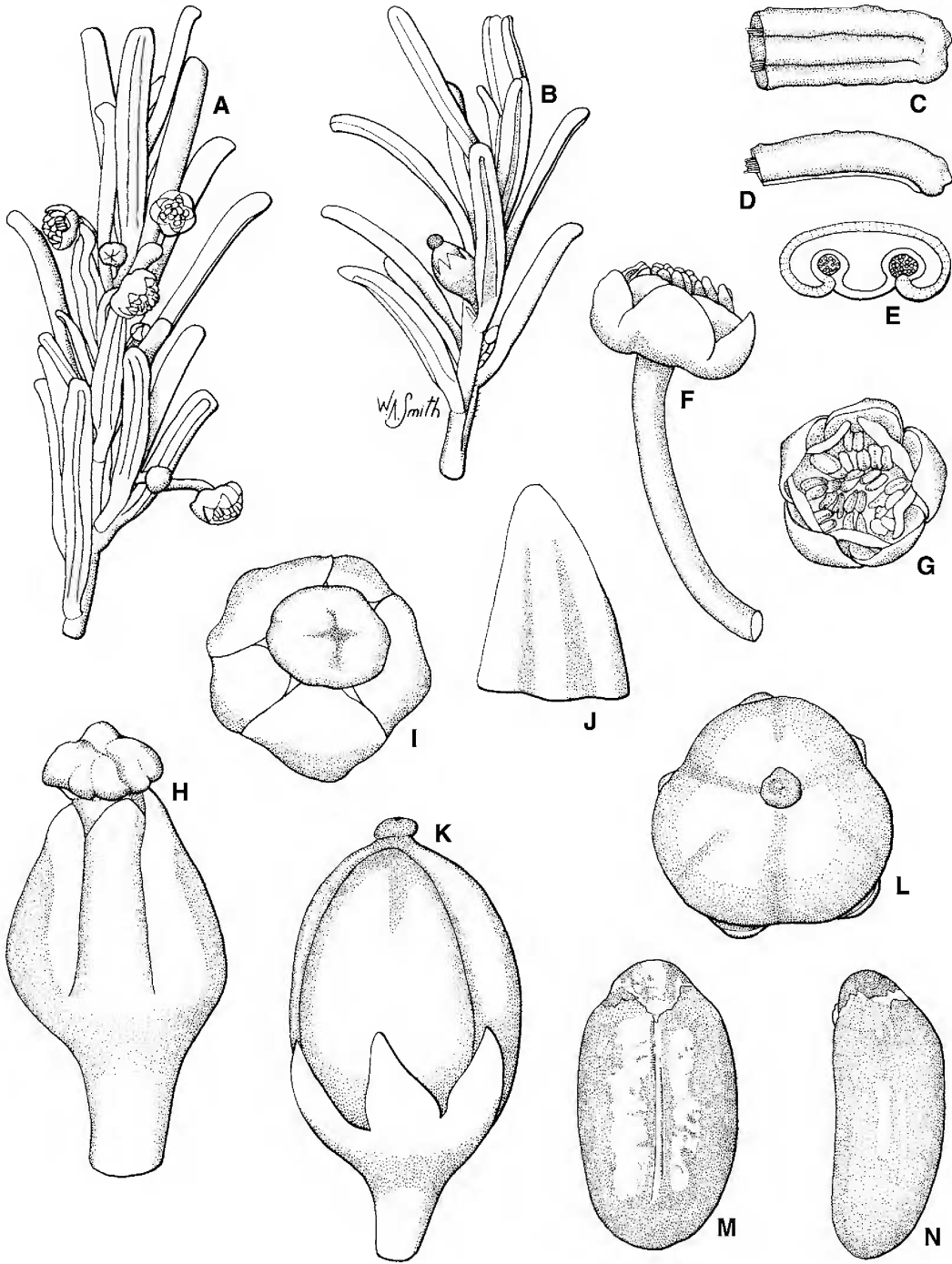


Fig. 3. *Beyeria cockertonii*. A. branchlet with male flowers $\times 4$. B. branchlet with immature fruit $\times 4$. C. abaxial view of leaf apex $\times 12$. D. side view of leaf apex $\times 12$. E. transverse section of leaf $\times 24$. F. side view of male flower $\times 12$. G. face view of male flower $\times 12$. H. side view of female flower $\times 24$. I. face view of female flower $\times 22$. J. adaxial view of calyx lobe from female flower $\times 24$. K. side view of fruit $\times 12$. L. face view of fruit $\times 12$. M. abaxial view of seed $\times 16$. N. side view of seed $\times 16$. A–N from *Halford Q9139 & Cockerton* (BRI). Del. W.Smith.

Notes: *Beyeria cockertonii* is listed as Declared Rare Flora under the *Western Australian Wildlife Conservation Act 1950*, under the name *Beyeria* sp. Bandalup Hill (G.Cockerton 7553) (Florabase, <http://florabase.dec.wa.gov.au> [accessed June 2008]).

Etymology: The specific epithet honours Geoff Cockerton (Managing Director, Landcare Services Pty Ltd) who discovered and collected this species and subsequently brought it to our attention.

12. *Beyeria constellata* Halford & R.J.F.Hend. **species nova** floribus maribus et femineis calyce lobis manifeste carinatis a speciebus omnibus ceteris *Beyeriae* clare distincta. **Typus:** Western Australia. *c.* 4 km E of Cadoux, 14 September 1988, *R.J.F.Henderson H3158* (holo: BRI; iso: K, MEL, PERTH, distribuendi).

Monoecious, erect much-branched **shrubs** to 0.6 m high, resinous on most parts. Young branchlets white to pale green, \pm angular becoming terete with age, longitudinally ridged, densely hairy between resinous ridges; hairs stellate, sessile, 0.2–0.3 mm across; older branchlets with grey to black shallowly furrowed bark. **Leaves** petiolate; petioles 0.7–1.3 mm long, hairy adaxially, glabrous abaxially; blades oblong or narrow-elliptic, 10–20 mm long, 2–5 mm wide, length: width ratio 3–7:1; adaxial surface glabrous, minutely papillose (obscured by thick resinous covering); abaxial surface densely hairy with \pm sessile, stellate hairs up to 0.8 mm across; base abruptly cuneate; margins recurved to revolute occasionally to midrib concealing abaxial leaf surface; apex rounded or sometimes retuse; midvein impressed adaxially, abaxially prominently raised and flattened, glabrous and resinous on abaxial face; secondary and tertiary veins obscure; marginal glands absent. **Flowers** pedicellate, axillary or terminal on short axillary branchlets, solitary or rarely 2 per axil; bracts \pm foliose, oblong, up to 1 mm long, rounded at apex, \pm glabrous adaxially, stellate hairy abaxially; pedicels slender or stout, sparsely hairy proximally with minute erect glandular hairs *c.* 0.1 mm long (mostly obscured by

resinous covering); calyx lobes 5, light green to yellow-green with flushes of red especially along the margins, suborbicular, concave adaxially, prominently keeled abaxially, glabrous, the margins usually erose, obtuse to rounded at apex; petals slightly shorter than or equal to calyx lobes, \pm erect, glabrous abaxially, densely villose abaxially; disc of 5 discrete glands; glands fleshy, 0.3–0.4 mm long, glabrous, rounded to truncate. **Male flowers** with pedicels 13–16 mm long; calyx lobes 1.6–1.8 mm long, 1.7–2.3 mm wide, surrounding androecium at anthesis; petals transverse-elliptic, 0.5–0.6 mm long, 0.5–0.6 mm wide, with erose margins; receptacle 2–2.5 mm across, stellate hairy; stamens 30–60; filaments erect, 1–1.3 mm long, glabrous, entire or bifid distally; anthers 0.3–0.4 mm long. **Female flowers** with pedicels 8–18 mm long; calyx lobes \pm appressed to and enclosing gynoecium apart from stigma, 1.5–1.8 mm long, 1.6–1.7 mm wide; petals persistent, broad-ovate, 1.4–1.6 mm long, 1.6–1.8 mm wide, with entire margins; ovary subglobose, trigonal, *c.* 1.2 mm long, densely hairy proximally, 3-locular; style 0.5–0.7 mm long, glabrous; stigma \pm discoid, 3-lobulate, glabrous, with margins entire, recurved. **Fruits** subglobose, trilobate, 4–6 mm long, 5–6 mm across, mostly 3-seeded, hairy proximally, glabrous, papillose distally (obscured by resinous covering); persistent calyx *c.* half the length of mature fruit. **Seeds** subglobose, dorsiventrally compressed, *c.* 3.6 mm long (including caruncle), 3.2 mm across and 2.4 mm in thickness; testa of unknown colour when fresh; caruncle *c.* 1 mm long and 1.5 mm wide, creamy-white. **Fig. 4.**

Additional specimens examined: Western Australia. 5 km W [E] of Cadoux at Johnson road turnoff, Sep 1983, *Purdie 5293* (CANB); Cadoux Pump road, *c.* 7 km E of Cadoux on road to Koorda, near Rabbit Proof Fence road, Sep 2006, *Halford Q9145 & Cockerton* (BRI, MEL, PERTH); no.2 Rabbit Fence, E of Manmanning, Sep 1982, *Smith 129* (CANB, MEL, PERTH).

Distribution and habitat: *Beyeria constellata* is confined to the Cadoux and Manmanning districts in south-western Western Australia (**Map 14**). It grows in scrub with *Eucalyptus oldfieldii* on sand over laterite and in *Eucalyptus* woodland on grey sandy soil.

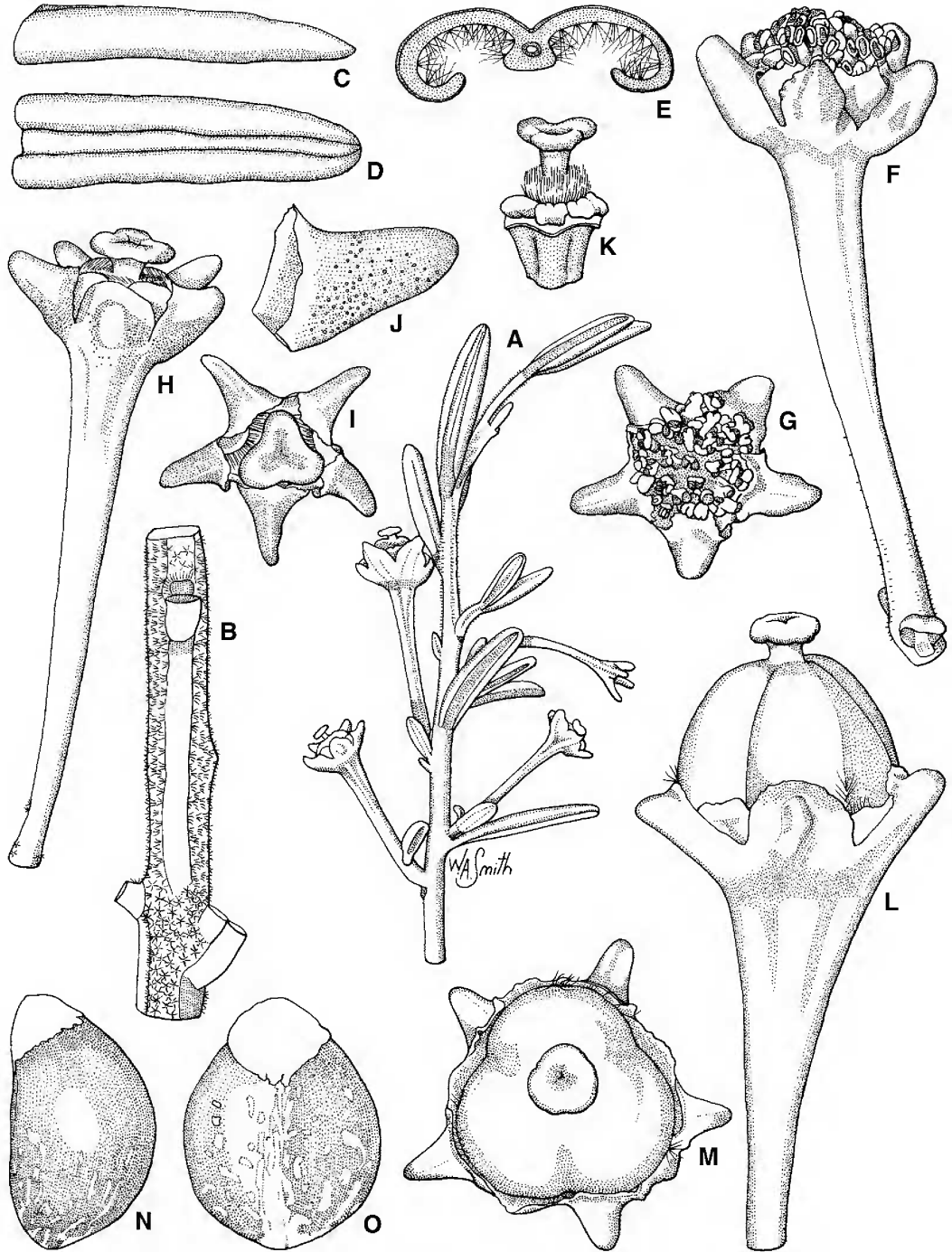


Fig. 4. *Beyeria constellata*. A. branchlet with female flowers $\times 2$. B. branchlet showing stellate indumentum $\times 6$. C. side view of leaf apex $\times 6$. D. abaxial view of leaf apex $\times 6$. E. transverse section of leaf $\times 12$. F. side view of male flower $\times 6$. G. face view of male flower $\times 6$. H. side view of female flower $\times 6$. I. face view of female flower $\times 6$. J. side view of calyx lobe from female flower $\times 12$. K. side view of female flower with calyx and petals removed, showing disc glands, ovary and style $\times 6$. L. side view of fruit $\times 6$. M. face view of fruit $\times 6$. N. side view of seed $\times 10$. O. abaxial view of seed $\times 10$. A–O from *Henderson H3158* (BRI). Del. W. Smith.

Phenology: Flowers and fruits have been collected in September.

Affinities: *Beyeria constellata* when in flower or fruit is not easily confused with any other species of *Beyeria*. The prominent keel on the calyx lobes of male and female flowers clearly distinguishes it from all other *Beyeria* species.

Etymology: The specific epithet is from Latin, *constellatus*, studded with stars, in reference to the conspicuous star-like appearance of the flowers of this species.

13. *Beyeria disciformis* Halford & R.J.F.Hend. **species nova** *B. minori* (Airy Shaw) Halford & R.J.F.Hend. maxime affinis nec non *B. calycinae* Airy Shaw affinis. Ab illa foliis laminis longioribus et proportione angustioribus, 10–16 mm longis × 1.3–2.3 mm latis non 5–10 mm longis × 1.6–2.5 mm latis, angusti-oblongis usque ad linearis non angusti-oblongis usque ad angusti-ellipticis, floribus femineis stigmatate minore, 0.1–0.3 mm lato non 0.7–0.9 mm lato, pedicellis glandulosis pubescentibus non glabris et bracteis ovatis et dense pubescentibus adaxialiter non angusti-oblongis et plene glabris differt. Ab hac foliorum laminis et petiolis et bracteis brevioribus et floribus et fructibus plerumque parvioribus differt. **Typus:** Western Australia. *c.* 2 km from Buntine along road to Wubin, 13 September 1988, *R.J.F.Henderson H3155* (holo: BRI; iso: CANB, K, MEL, PERTH, distribuendi).

Monoecious, spreading, much-branched **shrubs** to 1 m high, resinous on most parts. Young branchlets pale green, ± angular becoming terete with age, longitudinally grooved, glabrous; older branchlets with grey to black shallowly fissured bark. **Leaves** petiolate; petioles 0.5–1 mm long, glabrous, minutely papillose (usually obscured by resinous covering); blades narrow-oblong to linear, 10–16 mm long, 1.3–2.3 mm wide, length:width ratio 6–8:1, recurved distally; adaxial surface glabrous, minutely papillose (usually obscured by resinous covering); abaxial surface densely hairy with ± sessile, stellate hairs up to 0.6 mm across; base cuneate; margins recurved to midrib concealing abaxial leaf surface; apex rounded

or obtuse, ultimately apiculate with extension from midrib; apiculum stout, 0.3–0.6 mm long, recurved; midvein slightly raised or impressed adaxially, abaxially prominently raised and flattened, glabrous and resinous on abaxial face; secondary and tertiary veins obscure; marginal glands occasionally present on blade, up to 2 mm from base, 1 per side of midrib, sessile, smooth, up to 0.2 mm across. **Flowers** pedicellate, axillary, solitary; bracts ovate, 0.5–1.3 mm long, cymbiform, acute at apex, glabrous abaxially, densely hairy with weakly ascending, simple hairs up to 0.3 mm long adaxially; pedicels slender, sparsely hairy proximally with minute erect glandular hairs *c.* 0.05 mm long; calyx lobes 5, pale green, suborbicular to very broad-ovate, glabrous, concavo-convex, the margins entire or erose, obtuse to rounded at apex; petals slightly shorter than or equal to calyx lobes, concavo-convex, the margins erose; disc obscure or absent. **Male flowers** with pedicels 2–4 mm long; calyx lobes 0.8–1.3 mm long, 1.4–1.7 mm wide, surrounding androecium at anthesis; petals suborbicular, 0.7–1.1 mm long, 0.8–1.4 mm wide, glabrous abaxially, densely villose adaxially proximally; receptacle 0.9–1.1 mm across, minutely hairy; stamens 15; filaments erect, 0.2–0.4 mm long, glabrous, entire or bifid distally; anthers 0.2–0.3 mm long. **Female flowers** with pedicels 2–6 mm long; calyx lobes accrescent, ± appressed to and enclosing gynoeceum apart from stigma, 1.4–2 mm long (2–3 mm long in fruit), 1.7–2.4 mm wide; petals marcescent, suborbicular to broad-obovate, 0.8–1.5 mm long, 1–1.5 mm wide, glabrous abaxially, densely villose adaxially; ovary subglobose, trigonal, 0.9–1.1 mm long, glabrous, 3-locular; style *c.* 0.1 mm long, glabrous; stigma discoid, 0.1–0.3 mm across, glabrous, with margins entire. **Fruits** subglobose, 3.5–4 mm long, 3–4 mm across, 2- or 3-seeded, glabrous, smooth; persistent calyx one half to two thirds the length of mature fruit. Seed not seen. **Fig. 5.**

Additional specimens examined: Western Australia. 2 miles [*c.* 3 km] N of Wubin, Sep 1966, *Knox 660902* (PERTH); Wubin, Oct 1965, *Knox 651043* (PERTH).

Distribution and habitat: *Beyeria disciformis* is known only from the vicinity of Wubin in south-western Western Australia (**Map 15**).

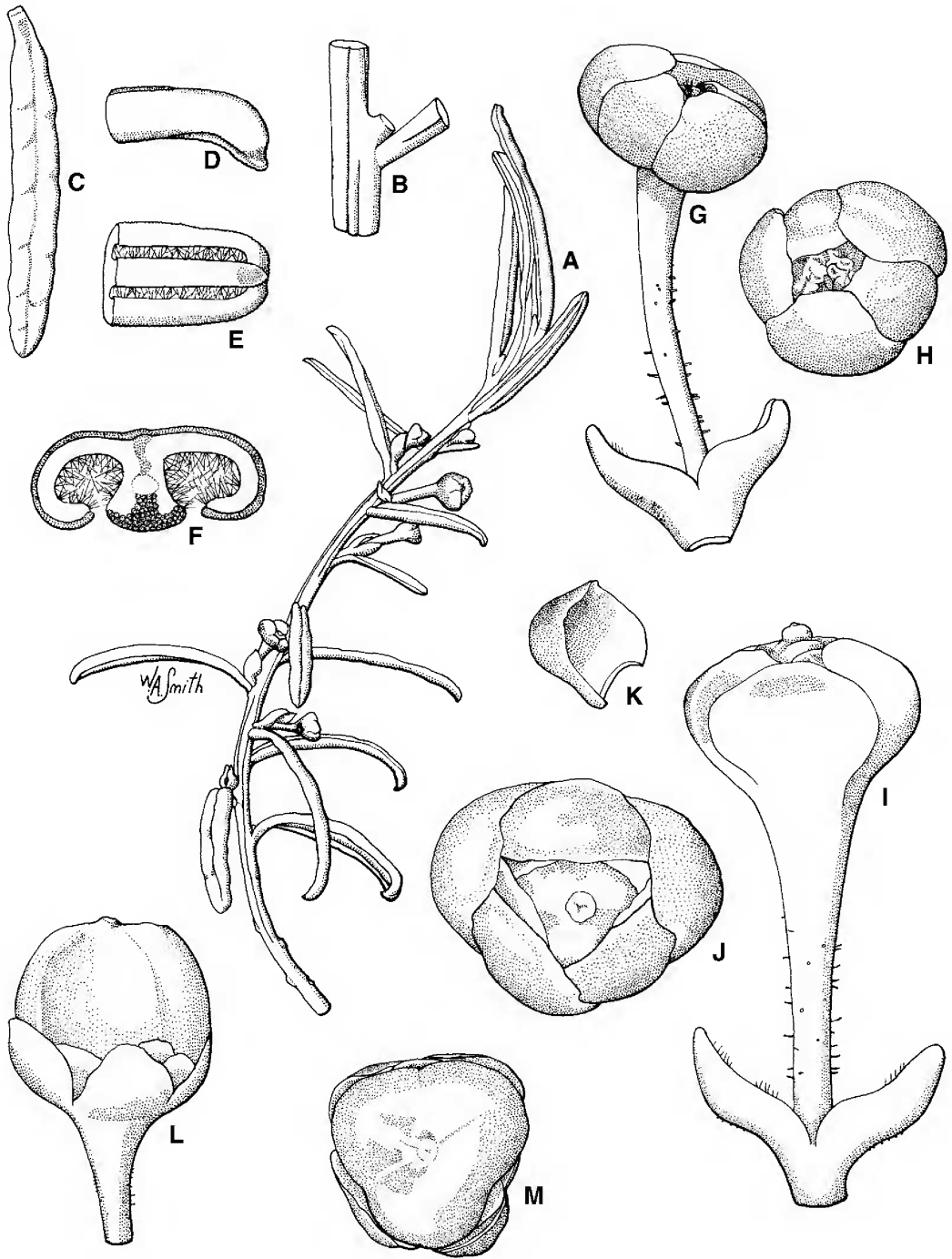


Fig. 5. *Beyeria disciformis*. A. branchlet with male and female flowers $\times 2$. B. branchlet showing longitudinal grooves $\times 6$. C. adaxial view of leaf $\times 4$. D. side view of leaf apex $\times 12$. E. abaxial view of leaf apex $\times 12$. F. transverse section of leaf $\times 24$. G. side view of male flower with bracts $\times 12$. H. face view of male flower $\times 12$. I. side view of female flower with bracts $\times 12$. J. face view of female flower $\times 12$. K. side view of calyx lobe from female flower $\times 12$. L. side view of fruit $\times 6$. M. face view of fruit $\times 6$. A–M from *Henderson H3155* (BRI). Del. W.Smith.

It grows on hard red loamy soil in remnant *Acacia/Hakea/Eucalyptus* shrubland.

Phenology: Flowers have been collected in September and October, fruits in October.

Affinities: *Beyeria disciformis* is similar to *B. minor* (Airy Shaw) Halford & R.J.F.Hend. and *B. calycina*. It differs from the former in having longer and proportionally narrower leaf blades, a different leaf blade shape,

smaller stigmas, glandular hairy pedicels and ovate bracts which are densely hairy adaxially compared with narrow-oblong and wholly glabrous bracts in *B. minor*. *Beyeria disciformis* differs from *B. calycina* in having generally shorter leaf blades, petioles and bracts and generally smaller flowers and fruits. These differences are summarized in **Table 1**.

Table 1. Comparison of morphological characters for *Beyeria disciformis*, *B. minor* and *B. calycina*

Character	<i>B. disciformis</i>	<i>B. minor</i>	<i>B. calycina</i>
leaf shape	narrow-oblong to linear	narrow-oblong to narrow-elliptic	linear
leaf dimensions (mm)	10–16 × 1.3–2.3	5–10 × 1.6–2.5	15–35 × 2–3
petiole length (mm)	0.5–1	0.6–1.2	0.8–2
stigma width (mm)	0.1–0.3	0.7–0.9	c. 0.3
pedicel	glandular hairy proximally	glabrous	with scattered hairs proximally
bract shape bract dimensions (mm)	ovate 0.5–1	narrow-oblong 0.6–1.1	ovate 3–4
bract adaxial surface	hairy	glabrous	hairy
calyx lobe length (mm) in male flower in female flower	0.8–1.3 1.4–2	c. 1.5 c. 2.5	1.2–1.5 2–3.5
petal length (mm) in male flower in female flower	0.7–1.1 0.8–1.5	c. 1 0.9–1	c. 1.5 2–2.5
fruit dimensions (mm)	3.5–4 × 3–4	4.5–5.5 × 4–5	c. 4.5 × 4–4.5

Etymology: The specific epithet is from Latin *disciformis*, disk-like, and refers to the shape of the stigma in this species.

14. *Beyeria gardneri* Airy Shaw, *Kew Bull.* 26: 68–69 (1971). **Type:** Western Australia. Irwin District: Murchison River, 30 August 1931, *C.A.Gardner 2588* (holo: PERTH; iso: PERTH).

Monoecious, slender, open **shrubs** to 0.7 m high, usually resinous on most parts. Young branchlets of unknown colour when fresh, terete, glabrous, tuberculate; older branchlets with greyish white shallowly fissured bark.

Leaves petiolate; petioles 0.8–2 mm long, glabrous, minutely papillose (usually obscured by resinous covering); blades narrow-oblong to linear, 5–16 mm long, 0.8–1.4 mm wide, length:width ratio 6–12:1; adaxial surface glabrous, sparsely tuberculate; abaxial surface densely hairy with hairs < 0.05 mm long; base cuneate; margins recurved to midrib concealing abaxial leaf surface; apex obtuse to rounded, recurved; midvein obscure adaxially, abaxially raised and rounded, glabrous; secondary and tertiary veins obscure; marginal glands absent. **Flowers** pedicellate, axillary, solitary or fasciculate

in 2- or 3-flowered fascicles; bracts ovate, up to 0.8 mm long, acute at apex, \pm glabrous; pedicels \pm glabrous, stouter on female flowers than on male flowers; calyx lobes 5, yellowish green, suborbicular to very broad-ovate, glabrous, concave adaxially, gibbose abaxially, the margins entire, rounded to obtuse at apex; petals slightly shorter than or equal to calyx lobes, erect, suborbicular or very broad-ovate, glabrous abaxially, sparsely to moderately villose adaxially, the margins \pm entire; disc of 5 discrete glands; glands thin, \pm oblong, 0.3–0.6, dorsi-ventrally compressed, glabrous, acute to rounded. **Male flowers** with pedicels 1–2 mm long; calyx lobes 0.5–0.9 mm long, 0.9–1.3 mm wide, surrounding androecium at anthesis; petals 0.5–0.9 mm long, 0.9–1 mm wide; receptacle *c.* 0.8 mm across, minutely hairy; stamens 10–12; filaments erect, 0.1–0.4 mm long, glabrous, bifid distally; anthers 0.2–0.3 mm long. **Female flowers** with pedicels 1–3 mm long; calyx lobes \pm appressed to and enclosing gynoecium apart from stigma, 0.9–1.3 mm long, 1.3–1.4 mm wide; petals marcescent, *c.* 1.3 mm long and 1.1 mm wide; ovary ellipsoid, \pm bilobate, *c.* 1 mm long, glabrous, 2-locular, with 4 short subapical appendages; style \pm obsolete; stigma discoid, 0.4–0.5 mm across, glabrous, with margins entire. **Fruits** subellipsoid, \pm laterally compressed when 2-seeded, 4–5.5 mm long, 4.5–5.5 mm across, with 2 or rarely 4 horn-like subapical appendages, 1- or rarely 2-seeded, glabrous, smooth; persistent calyx *c.* one fifth the length of mature fruit; subapical appendages up to 1 mm long. **Seeds** subglobose, slightly dorsi-ventrally compressed, *c.* 4 mm long

(including caruncle), 2.8–3 mm across, 2.7–3 mm in thickness; testa light to dark brown; caruncle *c.* 1.2 mm long and 0.7 mm wide, creamy-white.

Additional specimens examined: Western Australia. [localities withheld] Aug 1961, *Gardner 13318* (PERTH); Aug 1931, *Gardner 2588* (PERTH); Aug 1931, *Gardner & Blackall 598* (PERTH); Sep 1983, *Purdie 5220* (CANB); Oct 1963, *Chadwick 1672* (PERTH); Sep 1970, *Chapman 1292* (PERTH); Sep 1991, *Cranfield & Spencer 8068* (CANB); Sep 1977, *Hnatiuk 771198* (PERTH); Sep 1988, *Griffin 5229* (PERTH); Oct 1971, *Royce 9615* (PERTH).

Distribution and habitat: *Beyeria gardneri* is confined to subcoastal areas from Kalbarri southwards to Badgingarra and Watheroo in south-western Western Australia (**Map 16**). It grows in open heathland and shrubland communities on sandy soils mostly on undulating sand plains.

Phenology: Flowers and fruits have been collected from August to October.

Affinities: *Beyeria gardneri* is morphologically most similar to *B. similis* (Müll.Arg.) Benth. and both these species have fruits with subapical appendages which distinguishes them from other species of *Beyeria*. *Beyeria gardneri* differs from *B. similis* in having generally smaller leaf blades, shorter pedicels and shorter subapical appendages on its fruits. These differences are summarized in **Table 2**.

Notes: *Beyeria gardneri* is listed as Priority One under DEC Conservation Codes for Western Australian Flora (Florabase, <http://florabase.dec.wa.gov.au> [accessed June 2008]).

Table 2. Comparison of morphological characters for *Beyeria gardneri* and *B. similis*

Character	<i>B. gardneri</i>	<i>B. similis</i>
leaf dimensions (mm)	5–16 \times 0.8–1.4	20–50 \times 1.6–2.5
pedicel length (mm) of male flowers	1–2	2–3
of female flowers	1–3	5–10
fruit: subapical appendage length (mm)	up to 1	up to 2

15. *Beyeria lapidicola* Halford & R.J.F.Hend. **species nova** *B. disciformi* Halford & R.J.F.Hend. et *B. minori* (Airy Shaw) Halford & R.J.F.Hend. maxime affinis. Ab illa floribus pedicello 7–13 mm longo non 2–6 mm longo et bracteis oblongis, plusminusve foliosis et adaxialiter glabris non ovatis cymbiformibus et adaxialiter dense pubescentibus differt. Ab hac calycis lobis ovatis usque lato-ovatis non suborbicularibus vel lato-ovatis, floribus femineis stigmatibus 0.4–0.6 mm lato non 0.7–0.9 mm lato, folii apice obtuso non obtuso-apiculato et floribus femineis fructiferis calycis lobis non auctis differt. **Typus:** Western Australia. near Wiluna [precise locality withheld for conservation purposes], 18 August 2006, *A.Markey & S.Dillon 4114* (holo: PERTH).

Beyeria sp. Murchison (B. Jeanes s.n. 7/7/2005), in Florabase, <http://florabase.dec.wa.gov.au> [accessed June 2008].

Monoecious, spreading, much-branched **shrubs** to 1 m high, resinous on most parts. Young branchlets pale yellowish green, ± angular becoming terete with age, sometimes shallowly longitudinally grooved, glabrous; older branchlets with grey to black shallowly fissured bark. **Leaves** petiolate; petioles 1–1.6 mm long, glabrous, minutely papillose (usually obscured by resinous covering); blades narrow-oblong, 8–16 mm long, 1.4–2 mm wide; adaxial surface glabrous, minutely papillose (usually obscured by resinous covering); abaxial surface densely hairy with ± sessile, stellate hairs up to 0.3 mm across; base cuneate; margins recurved to midrib usually concealing abaxial leaf surface; apex rounded, ultimately apiculate (usually obscured by resinous covering) with extension from midrib; apiculum stout, up to 0.1 mm long; midvein slightly impressed adaxially, abaxially prominently raised and flattened, glabrous and resinous on abaxial face; secondary and tertiary veins obscure; marginal glands absent. **Flowers** pedicellate, axillary or terminal on short axillary branchlets, solitary; bracts oblong, ± foliose, up to 2.5 mm long, rounded at apex, glabrous adaxially, stellate hairy abaxially; pedicels slender, papillose (mostly obscured by resinous covering), stouter on female

flowers than on male flowers; calyx lobes 5, pale green, ovate to broad-ovate, glabrous, concavo-convex, the margins entire or erose, obtuse to rounded at apex; petals slightly shorter than calyx lobes, ± flat, the margins entire; disc of 5 discrete glands; glands fleshy, 0.2–0.3 mm long, laterally compressed, glabrous, truncate. **Male flowers** with pedicels 7–11 mm long; calyx lobes 1.2–1.4 mm long, 1.4–1.7 mm wide, surrounding androecium at anthesis; petals orbicular, *c.* 1 mm long and 1 mm wide, glabrous abaxially, sparsely villose adaxially; receptacle *c.* 1 mm across, minutely hairy; stamens 20; filaments erect, 0.2–0.4 mm long, glabrous, entire or bifid distally; anthers 0.2–0.3 mm long. **Female flowers** with pedicels 7–13 mm long; calyx lobes ± appressed to and enclosing gynoecium apart from stigma, 1.1–2 mm long, 0.9–1.5 mm wide; petals marcescent, suborbicular, 0.7–1 mm long, *c.* 0.7 mm wide, glabrous abaxially, densely villose adaxially; ovary subglobose, trigonal, *c.* 1.5 mm long, glabrous, 3-locular; style ± obsolete; stigma calyptriform, 0.4–0.6 mm across, glabrous, with margins shallowly lobed. **Fruits** ± ellipsoid, *c.* 4.5 mm long and 4 mm across, 2- or 3-seeded, glabrous, smooth; persistent calyx *c.* one fifth the length of mature fruit. Seed not seen. **Fig. 6.**

Additional specimens examined: Western Australia. [precise localities withheld] Jul 2006, *Capobianco AC702-14* (BRI); Sep 2006, *Meissner 736 & Bayliss* (PERTH); Sep 2006, *Meissner 737 & Bayliss* (BRI); Jul 2005, *Jeanes s.n.* (BRI).

Distribution and habitat: *Beyeria lapidicola* occurs on banded ironstone ranges near Meekatharra, Wiluna and Menzies in south-western Western Australia (**Map 17**). It grows in shrubland communities of *Callitris glaucophylla* and *Acacia* spp. or *Acacia aneura* on sandy loam soils, mostly on banded ironstone hills.

Phenology: Flowers and fruits have been collected from July to September.

Affinities: *Beyeria lapidicola* is most similar to *B. disciformis* and *B. minor* (Airy Shaw) Halford & R.J.F.Hend. It differs from *B. disciformis* in having fruit with longer pedicels which are 7–13 mm long compared with 2–6 mm long, bracts which are oblong, ± foliose and glabrous adaxially compared

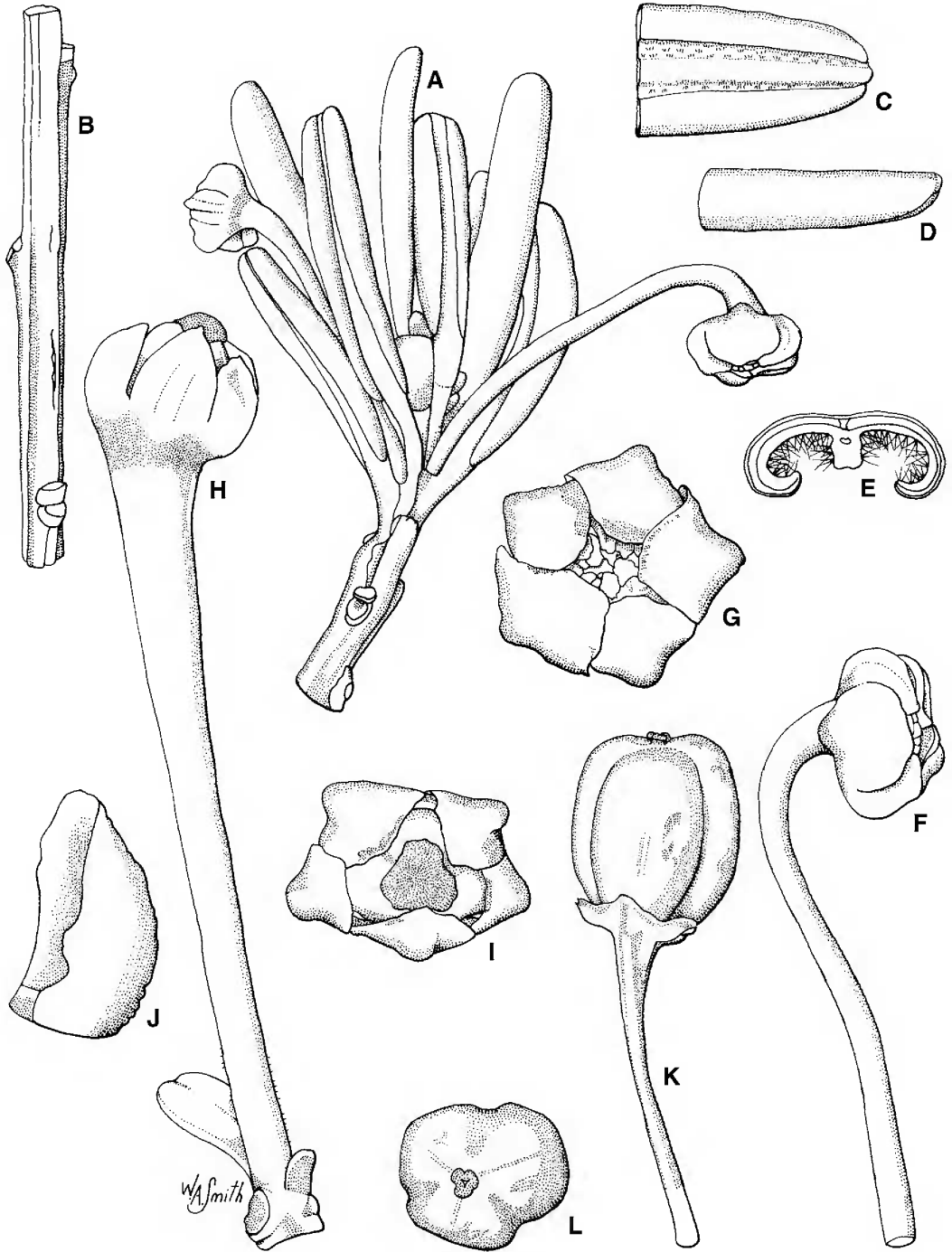


Fig. 6. *Beyeria lapidicola*. A. branchlet with male flowers $\times 6$. B. branchlet showing longitudinal grooves $\times 4$. C. abaxial view of leaf apex $\times 9$. D. side view of leaf apex $\times 9$. E. transverse section of leaf $\times 12$. F. side view of male flower $\times 9$. G. face view of male flower $\times 12$. H. side view of female flower $\times 9$. I. face view of female flower $\times 12$. J. side view of calyx lobe from female flower $\times 24$. K. side view of fruit $\times 6$. L. face view of fruit $\times 6$. A, C–G from *Meissner 737 & Bayliss* (BRI); B, H–J from *Jeanes s.n.*, Jul 2005 (BRI); K & L from *Markey 4114 & Dillon* (PERTH). Del. W.Smith.

with ovate, cymbiform bracts that are densely hairy adaxially and calyx lobes that do not enlarge as the fruit matures. It differs from *B. minor* in having the calyx lobes shaped differently (ovate to broad-ovate compared with suborbicular or very broad-ovate), female flowers with a smaller stigma which is 0.4–0.6 mm across compared with 0.7–0.9 mm across, an evenly rounded rather than an obtuse and apiculate leaf apex and calyx lobes that do not enlarge as the fruit matures.

Notes: *Beyeria lapidicola* is listed as Priority Two under DEC Conservation Codes for Western Australian Flora, under the name *Beyeria* sp. Murchison (B. Jeanes s.n. 7/7/2005) (Florabase, <http://florabase.dec.wa.gov.au> [accessed June 2008]).

Etymology: The specific epithet is derived from Latin *lapis*, stone, and *-cola*, dweller or inhabitant, in reference to the banded ironstone hills where this species has been recorded as growing.

16. *Beyeria latifolia* Baill., *Adansonia* 6: 304 (1866). **Type:** [Western Australia.] stony gully west from Mt Bland, *s.d.*, *s.coll.* (lecto [here chosen]: MEL 114159).

Beyeriopsis latifolia Müll.Arg., *Linnaea* 34: 57 (1865). **Type:** [Western Australia.] Point Henry, *s.d.*, [*A.F.*] *Oldfield s.n.* (lecto [here chosen]: G-DC *n.v.* [microfiche IDC 800-73 2454 II. 3, top element]; isolecto: K, MEL 114160).

Monoecious sometimes dioecious, spreading, much-branched **shrubs** to 0.7 m high, sometimes resinous on young shoots and flower buds. Young branchlets pale green, ± terete, densely hairy; hairs stellate, stipitate or sessile, *c.* 0.4 mm across; older branchlets with grey shallowly fissured bark. **Leaves** petiolate; petioles 4–7 mm long, sparsely to densely hairy with stellate hairs as for branchlets; blades ovate to broad-ovate, 10–30 mm long, 6–12 mm wide, length:width ratio 1.5–3:1; adaxial surface glabrous or with scattered stipitate stellate hairs *c.* 0.4 mm across, becoming glabrous with age, smooth or with scattered tubercles from persistent hair bases; abaxial surface densely hairy with ± sessile, stellate hairs *c.* 1 mm across; base obtuse to truncate; margins recurved to

revolute; apex obtuse to rounded; midvein slightly impressed adaxially, abaxially raised, sparsely to densely hairy; secondary veins obscure adaxially, abaxially raised; tertiary veins obscure; marginal glands rarely present on blade, up to 1 mm from blade base, 1 per side of midrib, ± sessile, smooth, *c.* 0.1 mm across. **Flowers** pedicellate, axillary, solitary; bracts ± ovate, *c.* 0.9 mm long, acute at apex, stellate hairy; pedicels sparsely to densely hairy with hairs as for branchlets, slightly stouter on female flowers than on male flowers; calyx lobes 5, yellowish green, suborbicular or ovate, concave and glabrous adaxially, gibbose with a few stellate hairs abaxially, the margins erose, rounded to obtuse to acute at apex; petals slightly shorter than or equal to calyx lobes, erect, suborbicular or depressed elliptic, glabrous abaxially, sparsely villose adaxially; disc of 5 discrete glands; glands fleshy, dorsi-ventrally compressed, *c.* 0.3 mm long, glabrous, truncate or irregularly lobed. **Male flowers** with pedicels 5–10 mm long; calyx lobes 1.5–1.7 mm long, 0.9–1.5 mm wide, surrounding androecium at anthesis; petals 0.5–1.5 mm long, 1.2–1.8 mm wide, the margins erose distally; receptacle *c.* 1 mm across, minutely hairy; stamens 9–11; filaments erect, 0.1–0.3 mm long, glabrous, bifid distally; anthers *c.* 0.4 mm long. **Female flowers** with pedicels 3–11 mm long; calyx lobes ± appressed to and enclosing gynoecium apart from stigma, 0.5–1 mm long, 0.7–1.4 mm wide; petals marcescent, 0.7–0.9 mm long, 0.7–0.9 mm wide, the margins entire; ovary ± ellipsoid, 0.9–1.3 mm long, densely stellate hairy, 2- or 3-locular; style ± obsolete; stigma calyptriform, 0.8–1 mm across, shallowly umbilicate, glabrous, with margins entire. **Fruits** ± ovoid, 6–6.5 mm long, 4–5.5 mm across, 1–3-seeded, sparsely hairy; persistent calyx *c.* one tenth the length of mature fruit. **Seeds** ellipsoid, dorsi-ventrally compressed, *c.* 6 mm long (including caruncle), 3 mm across and 2.5 mm in thickness; testa light to dark brown; caruncle *c.* 2 mm long and 1 mm wide, light brown.

Additional specimens examined: Western Australia. Gairdner River, Qualup [?], Oct 1928, *Gardner 2225* (PERTH); 20 miles [*c.* 32 km] W of Salmon Gums, Jan 1977, *Wittwer W2000* (PERTH); SE of Middle Mt Barren, Fitzgerald River Reserve, Dec 1970, *George*

10590 (CANB, PERTH); 2 km S of Thumb Peak, Fitzgerald River N.P., Oct 1976, *Newbey 4845* (CANB); West Mt Barren, Oct 1963, *Aplin 2769* (PERTH); *ibid*, Nov 1960, *George 1786* (PERTH); *ibid*, Oct 1965, *George s.n.* (PERTH); Mt Bland, Res. 24048, Jul 1970, *George 10055* (PERTH).

Distribution and habitat: *Beyeria latifolia* is confined to the south coast of Western Australia where it occurs east of Albany from Point Henry north-east to Thumb Peak in the Fitzgerald River National Park, with a disjunct population near Salmon Gums (**Map 18**). It grows in coastal scrub and mallee scrub communities on mostly sandy soils in sheltered sites.

Phenology: Flowers have been collected in January, July and from October to December, fruits in October and November.

Affinities: *Beyeria latifolia* is morphologically most similar to *B. cinerea* and *B. lepidopetala* F.Muell. *Beyeria latifolia* differs from the former by its leaf blade size, and fruit shape and size. *Beyeria latifolia* can be distinguished from *B. lepidopetala* by its leaf blade shape and size and shorter pedicels on female flowers. These differences are summarized in **Table 3**.

Table 3. Comparison of morphological characters for *Beyeria latifolia*, *B. cinerea* and *B. lepidopetala*

Character	<i>B. latifolia</i>	<i>B. cinerea</i>	<i>B. lepidopetala</i>
leaf dimensions (mm)	10–30 × 6–12	3–17 × 1.2–5	15–20 × 1.5–3
leaf shape	ovate to broad-ovate	narrow-ovate to broad-ovate, narrow-elliptic, triangular	linear
pedicel length (mm) of female flowers	3–11	1–7	10–30
fruit dimensions (mm) fruit shape	6–6.5 × 4–5.5 ovoid	4–6 × 2.5–3.8 pyriform	fruit not seen

Typification: In the protologue of *Beyeria latifolia*, Baillon (1866) cited three syntypes “*Oldfield*, n. 831, in vallibus umbrosis ad Portum Henry, Austral. austr.-occid.; *Lare?* in lapidosis orient. Montis Bland (herb. F.Muell.); *Drummond*, Swan-River (ser. 4, n. 216?)”. Two sheets of what is considered to be type material have been located in material loaned to BRI from MEL. These sheets are: Point Henry, *Oldfield 831* [114160] and Mt Bland, [114159]. In the absence of further suitable material, the collection from Mt Bland [114159] is here selected as lectotype of this name.

In the protologue of *Beyeriopsis latifolia*, Müller (1865) cited two collections “Point Henry (Oldfield, comm, Dr, F. Muell. in herb. DC!)” and “Swan River (Drummond ser. 4, n. 216!)”. These collections are mounted on a single sheet in G-DC. The Oldfield collection

is selected as lectotype of this name. The Oldfield collection in G-DC has the date 1863 on the lower edge of the Botanical Museum of Melbourne label. This we believed is the year in which the material was received by Müller Argoviensis from F. Mueller and is not the date of its collection.

17. *Beyeria lepidopetala* F.Muell., *Fragm.* 1: 230 (1859); *Beyeriopsis lepidopetala* (F.Muell.) Müll.Arg., *Linnaea* 34: 57 (1865). **Type:** [Western Australia.] Murchison, *s.d.*, *A.[F.] Oldfield s.n.* (lecto [here chosen]: MEL 98605; isolecto: K, MEL [2 sheets 114318, 2062919]).

Illustration: Hopper *et al.* (1990: 83).

Monoecious or dioecious, erect, open **shrubs** to 4 m high. Young branchlets of unknown colour when fresh, terete, densely hairy, becoming glabrous with age though

remaining tuberculate by persistent hair bases; hairs stellate, shortly stipitate, up to 0.5 mm across; older branchlets with grey shallowly furrowed bark. **Leaves** petiolate; petioles 1–2 mm long, hairy with indumentum as for branchlets; blades linear, 15–20 mm long, 1.5–3 mm wide, length: width ratio 5–10:1; adaxial surface sparsely hairy with stipitate stellate hairs *c.* 0.4 mm across, becoming glabrous with age though remaining sparsely tuberculate by persistent hair bases; abaxial surface densely hairy with \pm sessile, stellate hairs *c.* 0.5 mm across; base cuneate or obtuse; margin revolute or recurved usually to midrib concealing abaxial leaf surface; apex obtuse to acute; midvein slightly impressed adaxially, abaxially raised, densely stellate hairy; secondary and tertiary veins obscure; marginal glands occasionally present at base of blade, 1 per side of midrib, sessile, smooth, *c.* 0.1 mm across. **Flowers** pedicellate, axillary, solitary; bracts foliose, up to 5 mm long; pedicels sparsely stellate hairy, slightly stouter and longer on female flowers than on male flowers; calyx lobes 5, of unknown colour when fresh, suborbicular or broad-ovate, glabrous, concavo-convex, the margins erose, rounded at apex; petals slightly shorter than calyx lobes, erect, suborbicular, glabrous abaxially, sparsely villose adaxially, the margins erose distally; disc of 5 discrete glands; glands fleshy, 0.4–0.5 mm long, glabrous, rounded. **Male flowers** with pedicels 8–10 mm long; calyx lobes *c.* 1.5 mm long

and 1.5 mm wide, surrounding androecium at anthesis; petals *c.* 1.1 mm long and 1.4 mm wide; receptacle 0.8–1 mm across, minutely hairy; stamens 50; filaments erect, *c.* 0.2 mm long, glabrous, bifid distally; anthers *c.* 0.2 mm long. **Female flowers** with pedicels 10–30 mm long; calyx lobes \pm appressed to and enclosing gynoecium apart from stigma, *c.* 1.5 mm long and 1.5 mm wide; petals marcescent, *c.* 1 mm long and 1.2 mm wide; ovary ellipsoid, *c.* 1 mm long, densely stellate hairy, 3-locular; style \pm obsolete; stigma discoid, *c.* 0.8 mm across, glabrous, deeply tri-sulcate with margins entire. Mature fruit and seed not seen.

Additional specimens examined: Western Australia. [localities withheld] Aug 2003, *Wildflower Society Bushland Survey GDN1/56* (BRI), Aug 1974, *Cranfield 9326* (PERTH).

Distribution and habitat: *Beyeria lepidopetala* is known only from a small area near Geraldton, Western Australia (**Map 19**). It grows on yellow sandy clay.

Phenology: Flowers have been collected in August.

Affinities: *Beyeria lepidopetala* is morphologically most similar to *B. cinerea* and *B. latifolia*. It can be separated from both species by its leaf shape and size and pedicel length of the female flowers. These differences are summarized in **Table 4**.

Table 4. Comparison of morphological characters for *Beyeria lepidopetala*, *B. latifolia* and *B. cinerea*

Character	<i>B. lepidopetala</i>	<i>B. cinerea</i>	<i>B. latifolia</i>
leaf dimensions (mm)	15–20 \times 1.5–3	3–17 \times 1.2–5	10–30 \times 6–12
leaf shape	linear	narrow-ovate to broad-ovate narrow-elliptic, triangular	ovate to broad-ovate
pedicel length (mm) of female flowers	10–30	1–7	3–11

Typification: In the protologue of *Beyeria lepidopetala*, Mueller (1865) cited a single collection “In locis rupestribus ad flumen Murchison. *A. Oldfield*”. Four sheets of what

is considered to be original material have been located (three at MEL [98605, 114318 and 2062919] and one at K). The MEL sheet [98605] is selected here as lectotype of this

name because it is an ample specimen and has morphology that agrees with the description in the protologue.

Notes: Listed as Declared Rare Flora under the *Western Australian Wildlife Conservation Act 1950* (Florabase, <http://florabase.dec.wa.gov.au> [accessed June 2008]).

18. *Beyeria minor* (Airy Shaw) Halford & R.J.F.Hend. **combinatio et status nova**

Basionym: *Beyeria calycina* var. *minor* Airy Shaw, *Kew Bull.* 26: 70–71 (1971). **Type:** Western Australia. 85 miles [c. 136 km] E of Merredin, October 1964, *P.R. Jefferies 641006* (holo: PERTH; iso: PERTH).

Monoecious, erect **shrubs** to 0.8 m high, resinous on most parts. Young branchlets of unknown colour when fresh, \pm angular, longitudinally grooved, glabrous, thickly resinous; older branchlets terete, with grey to black shallowly fissured bark. **Leaves** petiolate; petioles 0.6–1.2 mm long, glabrous, minutely papillose (usually obscured by resinous covering); blades narrow-oblong to narrow-elliptic, 5–10 mm long, 1.6–2.5 mm wide, length:width ratio 3–4:1; adaxial surface glabrous, minutely papillose (usually obscured by resinous covering); abaxial surface densely hairy with \pm sessile, stellate hairs up to 0.9 mm across; base obtuse; margins recurved to midrib concealing abaxial leaf surface; apex rounded or obtuse, ultimately apiculate with extension from midrib; apiculum stout, up to 0.5 mm long, bent upward; midvein obscure or slightly raised adaxially, abaxially prominently raised and flattened, glabrous and resinous on abaxial face; secondary and tertiary veins obscure; marginal glands occasionally present on blade, up to 1 mm from blade base, 1 per side of midrib, sessile, smooth, up to 0.2 mm across. **Flowers** pedicellate, axillary, solitary; bracts narrow-oblong, 0.6–1.1 mm long, acute at apex, glabrous; pedicels glabrous, papillose usually obscured by resinous covering, stouter and longer on female flowers than on male flowers; calyx lobes 5, of unknown colour when fresh, suborbicular to very broad-ovate, glabrous, concavo-convex, obtuse to rounded at apex; petals slightly shorter than or equal to calyx lobes, suborbicular to oblate, erect,

glabrous abaxially, densely villose adaxially proximally, the margins erose; disc obscure or absent in male flowers, of 5 discrete glands in female flowers. **Male flowers** with pedicels 2–6 mm long; calyx lobes c. 1.5 mm long and 2 mm wide, the margins erose, surrounding androecium at anthesis; petals c. 1 mm long, and 1.3 mm wide; receptacle c. 1.5 mm across, minutely hairy; stamens 20; filaments erect, c. 0.3 mm long, glabrous, entire or bifid distally; anthers c. 0.4 mm long. **Female flowers** with pedicels 5–9 mm long; calyx lobes somewhat accrescent, \pm appressed to and enclosing gynoecium apart from stigma, c. 2.5 mm long (c. 3 mm long in fruit) and 2.6 mm wide, the margins entire; petals marcescent, 0.9–1 mm long, 1.3–1.5 mm wide; disc glands fleshy, ovate, c. 0.4 mm long, dorsi-ventrally compressed, glabrous, rounded; ovary subglobose, c. 1.2 mm long, glabrous, 3-locular; style c. 0.1 mm long, glabrous; stigma discoid to calyptriform, 0.7–0.9 mm across, glabrous, with margins entire, \pm incurved. **Fruits** subglobose, 4.5–5.5 mm long, 4–5 mm across, mostly 2- or 3-seeded, glabrous, smooth; persistent calyx c. half the length of mature fruit. **Seeds** ellipsoid, dorsi-ventrally compressed, 3.5–4.2 mm long (including caruncle), 2.6–2.9 mm across, 2–2.2 mm in thickness; testa light to dark brown; caruncle c. 0.7 mm long and 1 mm wide, creamy-white.

Additional selected specimens examined: **Western Australia.** 6 km N of Hickey Ricken Soak, c. 60 km N of Bullfinch, Sep 1970, *Wilson 8768* (PERTH); North Bungulla, Sep 1926, *Gardner s.n.* (PERTH); 800 m NNE of summit of Mt Holland, 87.5 km ENE of Hyden, Aug 1990, *Mollemans 3338* (BRI, PERTH).

Distribution and habitat: *Beyeria minor* is known from scattered localities near Southern Cross, Kellerberrin and Hyden in south-western Western Australia (**Map 20**). It grows in *Acacia* shrubland communities on red brown earths or deep sandy soils.

Phenology: Flowers have been collected from August to October, fruits in October.

Affinities: *Beyeria minor* is morphologically most similar to *B. calycina* and *B. disciformis*. It differs from the former by its smaller leaf blades (5–10 mm long \times 1.6–2.5 mm wide compared with 15–35 mm long \times 2–3 mm

wide) that are narrow-oblong to narrow-elliptic rather than linear in outline, and its smaller accrescent calyx lobes in female flowers (that are up to 3 mm long compared with up to 7 mm long). For features distinguishing *B. minor* from *B. disciformis*, refer to the 'Affinities' section under that species.

19. *Beyeria physaphylla* Halford & R.J.F.Hend. **species nova** strato viscido tenui in partibus maxime et ramulis glabris et longitudinaliter sulcatis *B. calycinae* Airy Shaw et *B. minori* (Airy Shaw) Halford & R.J.F.Hend. ut videtur maxime affinis sed ab utroque forma et amplitudine foliorum et apice laminae folii rotundato non apiculato et calycis lobis non accrescentibus post florescentiam distinguenda est. **Typus:** Western Australia. *c.* 5.5 km ESE of Scaddan, on Scaddan road to Bostock Swamp, 19 September 1988, *R.J.F.Henderson H3180* (holo: BRI; iso: K, MEL, PERTH, distribuendi).

Beyeria sp. Scaddan (P. van der Moezel PGV161), in Florabase, <http://florabase.dec.wa.gov.au> [accessed June 2008].

Monoecious or dioecious, erect, much-branched **shrubs** to 0.5 m high, thinly resinous on most parts. Young branchlets light brown, \pm terete, longitudinally sulcate, glabrous; older branchlets with grey tessellated bark. **Leaves** mostly crowded on short lateral branchlets, petiolate; petioles 0.5–1 mm long, glabrous; blades obovate, 2.8–4.5 mm long, 1.5–2.2 mm wide, length:width ratio 1.5–2:1; adaxial surface glabrous and \pm smooth, resinous; abaxial surface densely hairy with \pm sessile, stellate hairs up to 0.6 mm across; base cuneate; margins recurved to midrib concealing abaxial leaf surface; apex rounded; midvein obscure adaxially, abaxially raised, \pm flattened, glabrous and resinous on abaxial face; secondary and tertiary veins obscure; marginal glands absent. **Flowers** pedicellate, axillary, solitary; bracts oblong or obovate, 0.5–1.3 mm long, rounded at apex, glabrous; pedicels glabrous, stouter on female flowers than on male flowers; calyx lobes 5, suborbicular, glabrous, concave adaxially, gibbose abaxially, the margins erose, obtuse to rounded at apex; petals slightly shorter than or equal to calyx lobes, erect, glabrous

abaxially, sparsely to moderately villose adaxially, the margins erose distally; disc obscure or absent. **Male flowers** with pedicels 2–4 mm long; calyx lobes 1–1.3 mm long, 1–1.1 mm wide, surrounding androecium at anthesis; petals suborbicular or depressed obovate, 0.5–0.6 mm long, 0.5–0.6 mm wide; receptacle 0.8–1 mm across, minutely hairy; stamens 9–11; filaments erect, 0.1–0.3 mm long, glabrous, bifid distally; anthers 0.2–0.3 mm long. **Female flowers** with pedicels 3–4 mm long; calyx lobes \pm appressed to and enclosing gynoecium apart from stigma, 0.9–1 mm long, 0.8–1.1 mm wide; petals marcescent, broad-oblong, 0.5–0.8 mm long, 0.5–0.8 mm wide; ovary subglobose, *c.* 0.5 mm long, glabrous, 3-locular; style *c.* 0.1 mm long, glabrous; stigma calyptriform, *c.* 0.9 mm across, glabrous except for minute scattered hairs on margin, with margins entire. **Fruits** \pm ellipsoid, sometimes laterally compressed, 4–4.7 mm long, 3.2–4.7 mm across, 1- or 2-seeded, glabrous, \pm smooth; persistent calyx *c.* one fifth the length of mature fruit. **Seeds** ellipsoid, dorsi-ventrally compressed, *c.* 3.5 mm long (including caruncle), 2.5 mm across and 2.1 mm in thickness; testa mottled, light and dark brown; caruncle *c.* 0.8 mm long and 1.6 mm wide, light brown. **Fig. 7.**

Additional specimens examined: Western Australia. *c.* 5.5 km WSW of Scaddan, on Scaddan road to Bostock Swamp, 19 Sep 1988, *Henderson H3179* (BRI); 10 km E of Scaddan on Scaddan road, Aug 1982, *van der Moezel PGV161* (PERTH).

Distribution and habitat: *Beyeria physaphylla* is known only from near Scaddan, south-western Western Australia (**Map 21**). It grows in mallee eucalypt woodland with a shrubby layer of *Melaleuca* spp., *Hakea* spp. and *Leptospermum* sp., on grey sandy soil on the edge of a salt lake.

Phenology: Flowers and fruits have been collected in September.

Affinities: *Beyeria physaphylla* is most similar to *B. calycina* and *B. minor* in having a thin viscid covering over most parts and branchlets that are glabrous and longitudinally sulcate. *Beyeria physaphylla* can be distinguished from both these species by its leaf blade shape and size, its lack of an apiculum at the leaf apex, and in its calyx

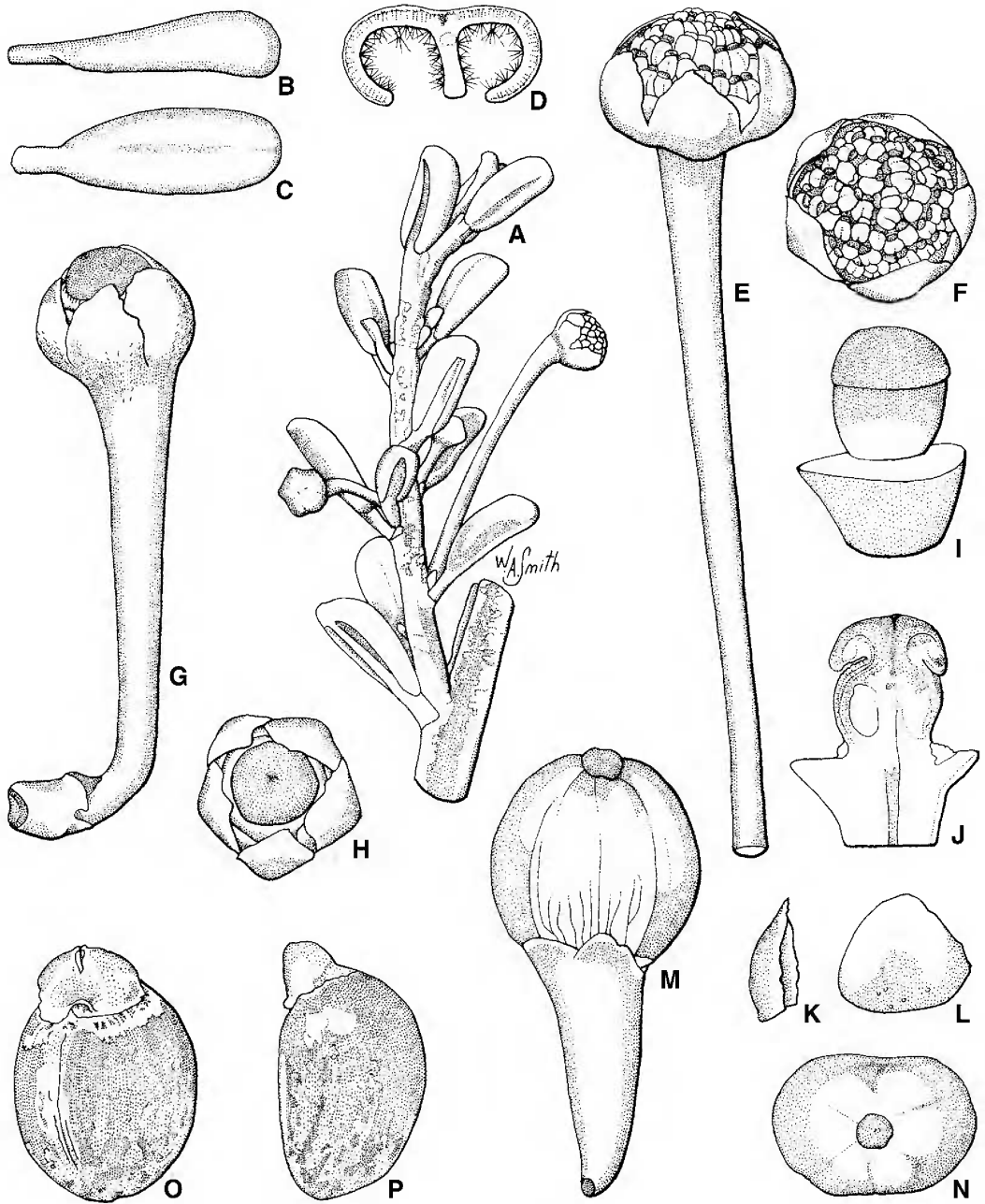


Fig. 7. *Beyeria physaphylla*. A. branchlet with male flowers $\times 4$. B. side view of leaf $\times 6$. C. adaxial view of leaf $\times 6$. D. transverse section of leaf $\times 12$. E. side view of male flower $\times 12$. F. face view of male flower $\times 12$. G. side view of female flower $\times 12$. H. face view of female flower $\times 12$. I. side view of ovary and style on receptacle $\times 15$. J. transverse section of stigma and ovary $\times 15$. K. side view of calyx lobe from female flower $\times 15$. L. abaxial view of calyx lobe from female flower $\times 15$. M. side view of fruit $\times 6$. N. face view of fruit $\times 6$. O. abaxial view of seed $\times 10$. P. side view of seed $\times 10$. A–P from *Henderson H3180* (BRI). Del. W.Smith.

Table 5. Comparison of morphological characters for *Beyeria calycina*, *B. minor* and *B. physaphylla*

Character	<i>B. calycina</i>	<i>B. minor</i>	<i>B. physaphylla</i>
leaf shape	linear	narrow-oblong to narrow-elliptic	obovate
leaf dimensions (mm)	15–35 × 2–3	5–10 × 1.6–2.5	3–4.5 × 1.6–2.2
leaf apex	apiculate	apiculate	rounded
calyx lobes after flowering	accrescent	accrescent	not enlarging

lobes which do not enlarge as the fruit matures. These differences are summarized in **Table 5**.

Etymology: The specific epithet is from Greek, *physao*, puff up, distend, inflate, and *-phyllus*, -leaved, and refers to the inflated appearance of the leaf blades of this species.

20. *Beyeria rostellata* Halford & R.J.F.Hend. **species nova** *B. disciformi* Halford & R.J.F.Hend. et *B. minori* (Airy Shaw) Halford & R.J.F.Hend. ut videtur maxime affinis sed ab utroque sed foliorum petiolo longiore (1.5–2 mm longo non 0.5–1 mm longo ut in *B. disciformi* vel 0.6–1.2 mm longo ut in *B. minore*), stylo in floribus femineis longiore (c. 0.6 mm longo non c. 0.1 mm longo ut in *B. disciformi* et *B. minore*), pilis stellatis in pagina abaxiali laminae folii minoribus (0.05 mm diam. non 0.6 mm diam. ut in *B. disciformi* et *B. minore*), calycis lobis lato-oblongis, oblongis vel angusto-ovatis non suborbicularis vel latissime ovatis et apice laminae folii rotundato non obtuso et apiculato valido differt. A *B. minore* lamina folii angusto-oblonga usque ad lineari non oblonga usque ad oblongo-elliptica et calycis lobis non accrescentibus nec non differt. **Typus:** Western Australia. [precise locality withheld] Jackson Range, 7 September 2006, *D.Halford Q9143* & *G.Cockerton* (holo: PERTH; iso: BRI, MEL, MO).

Beyeria sp. Jackson Range (R. Cranfield & P. Spencer 7751), in Florabase, <http://florabase.dec.wa.gov.au> [accessed June 2008].

Monoecious, erect, **shrubs** to 1.8 m high, resinous on most parts, thickly so on young shoots and adaxial leaf surface. Young

branchlets of unknown colour when fresh state, ± terete, longitudinally sulcate, glabrous; older branchlets with grey to black shallowly fissured bark. **Leaves** petiolate; petioles 1.5–2 mm long, glabrous, minutely papillose (usually obscured by resinous covering); blades narrow-oblong to linear, 13–20 mm long, 1.2–2.3 mm wide, length: width ratio 5–9:1; adaxial surface glabrous and minutely papillose (usually obscured by resinous covering); abaxial surface densely hairy with sessile, stellate hairs up to 0.5 mm across; base cuneate or obtuse; margins recurved usually to midrib concealing abaxial leaf surface; apex rounded, ultimately terminated by sessile gland; midvein impressed adaxially, abaxially prominently raised, ± flattened and glabrous on abaxial face; secondary and tertiary veins obscure; marginal glands absent. **Flowers** pedicellate, axillary, solitary; bracts oblong, c. 1.1 mm long, rounded at apex, glabrous; pedicels ± glabrous except for minute erect glandular hairs proximally, slightly stouter and longer on female flowers than on male flowers; calyx lobes 5, green, glabrous, slightly concavo-convex, the margins ± entire, rounded at apex; petals slightly shorter than or equal to calyx lobes, erect, glabrous abaxially, densely villose adaxially proximally, the margins erose; disc of 5 discrete glands; glands fleshy, c. 0.2 mm long, laterally compressed, glabrous. **Male flowers** with pedicels 3–5 mm long; calyx lobes broad-oblong, 1.3–1.5 mm long, 0.8–1 mm wide, surrounding androecium at anthesis; petals depressed obovate, c. 1.4 mm long and 1.6 mm wide; disc glands truncate or irregularly lobed distally; receptacle 0.9–1.1 mm across, minutely hairy; stamens 25;

filaments erect, 0.3–0.5 mm long, glabrous, entire; anthers 0.4–0.5 mm long. **Female flowers** with pedicels 5–7 mm long; calyx lobes ± appressed and enclosing gynoecium apart from stigma, oblong or narrow-ovate, *c.* 2.3 mm long and 1.3 mm wide; petals caducous, obovate, *c.* 1.4 mm long and 0.9 mm wide; disc glands entire, rounded; ovary subglobose, 0.9–1.1 mm long, glabrous, 3-locular; style *c.* 0.6 mm long, glabrous; stigma discoid, *c.* 0.7 mm across, glabrous, with margins ± entire. **Fruits** ellipsoid, 5–5.5 mm long, 3.5–4 mm across, 2- or 3-seeded, glabrous, ± smooth; persistent calyx *c.* one third the length of mature fruit. **Seeds** ellipsoid, dorsi-ventrally compressed, 4.5–6.0 mm long (including caruncle), 2.5–2.6 mm across, 1.8–2.1 mm in thickness; testa dark brown; caruncle *c.* 0.7 mm long and 1.2 mm wide, light brown. **Fig. 8.**

Additional selected specimens examined: Western Australia. [precise localities withheld for conservation purposes] May 1978, *Keighery* 1640 (PERTH); Jul 1990,

Mollemans & Mollemans 3101 (BRI, CANB); Nov 1996, *Sweedman* 4365 (PERTH); Sep 1989, *Cranfield & Spencer* 7751 (PERTH); Nov 2000, *Carlino* 174.TC20 (PERTH); Oct 2003, *Cockerton* 9106 (BRI); Nov 2000, *Mattiske* 175-2/249 (PERTH); Nov 2000, *Mattiske* 193-2/586 (PERTH); Aug 2002, *Bull s.n.* (PERTH); Oct 2000, *Mattiske* J39-149 (PERTH); Sep 1981, *Newbey* 9024 (PERTH).

Distribution and habitat: *Beyeria rostellata* is known only from the slopes and summit of Mt Jackson Range, south-western Western Australia (**Map 22**). It grows in *Acacia* and *Eucalyptus* tall shrubland or low open woodland on skeletal red sandy to clay soils over banded ironstone substrates.

Phenology: Flowers have been collected in May, July and September, fruits in July, September and December.

Affinities: *Beyeria rostellata* is most similar to *B. disciformis* and *B. minor*. The differences are summarized in **Table 6**.

Table 6. Comparison of morphological characters for *Beyeria rostellata*, *B. disciformis* and *B. minor*

Character	<i>B. rostellata</i>	<i>B. disciformis</i>	<i>B. minor</i>
petiole length (mm)	1.5–2	0.5–1	0.6–1.2
leaf shape	narrow-oblong to linear	oblong to oblong-elliptic	narrow-oblong to narrow-elliptic
leaf length (mm)	13–20	10–16	5–10
leaf apex	rounded, without stout apiculum	rounded or obtuse, with stout apiculum	rounded or obtuse, with stout apiculum
calyx lobes shape	broad-oblong, oblong, narrow ovate	suborbicular to very broad-ovate	suborbicular to very broad-ovate
calyx lobes after flowering	not enlarging	accrescent	accrescent
style length (mm)	<i>c.</i> 0.6	<i>c.</i> 0.1	<i>c.</i> 0.1

Notes: *Beyeria rostellata* is listed as Priority One under DEC Conservation Codes for Western Australian Flora, under the name *Beyeria* sp. Jackson Range (R. Cranfield & P. Spencer 7751) (Florabase, <http://florabase.dec.wa.gov.au> [accessed June 2008]).

Etymology: The specific epithet is from Latin *rostellatus*, provided with a short beak, and refers to the prominent persistent style on the fruit of this species.

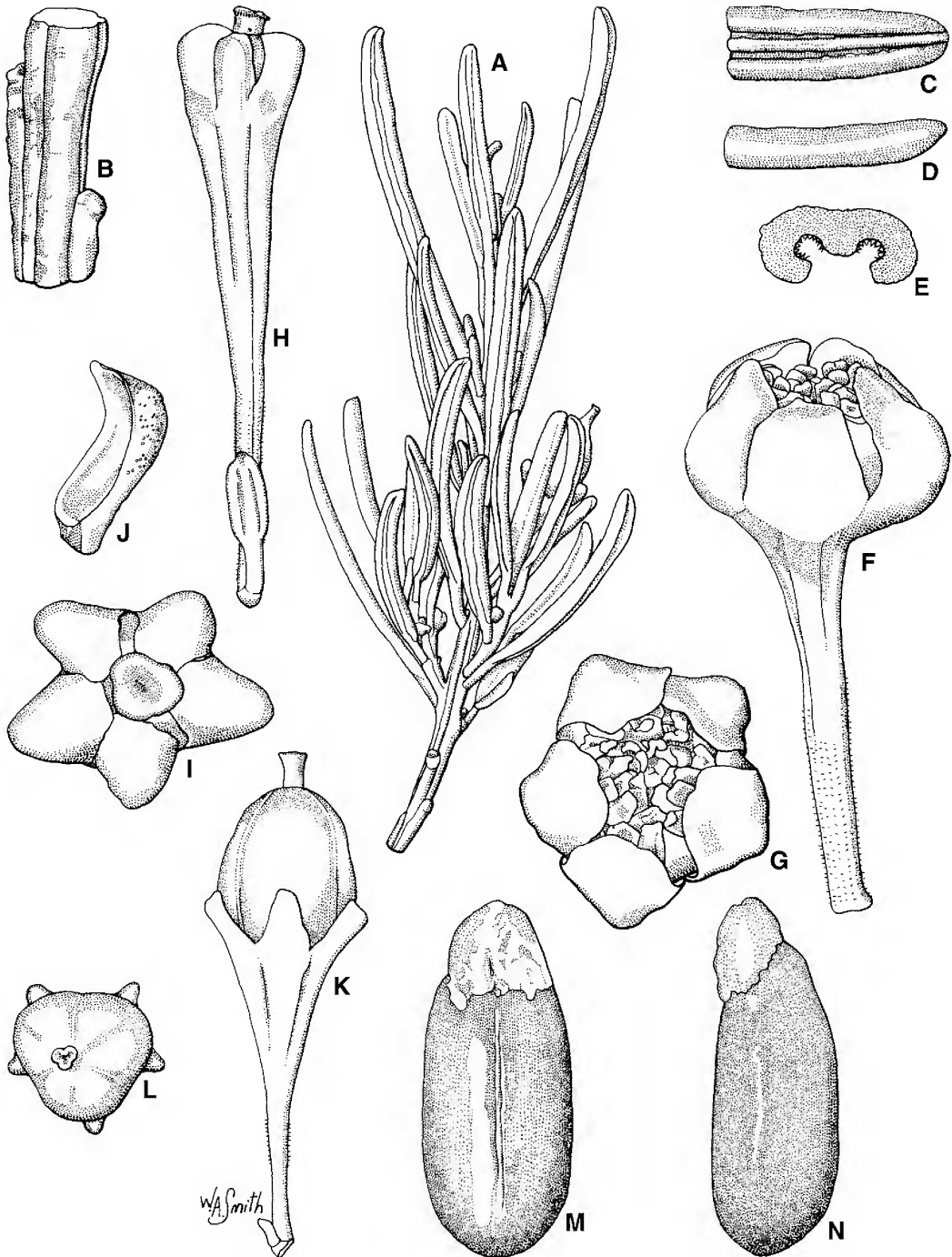


Fig. 8. *Beyeria rostellata*. A. branchlet with fruit $\times 2$. B. branchlet showing longitudinal grooves $\times 8$. C. abaxial view of leaf apex $\times 6$. D. side view of leaf apex $\times 6$. E. transverse section of leaf $\times 12$. F. side view of male flower $\times 12$. G. face view of male flower $\times 12$. H. side view of female flower $\times 6$. I. face view of female flower $\times 12$. J. side view of calyx lobe from female flower $\times 12$. K. side view of fruit $\times 4$. L. face view of fruit $\times 4$. M. abaxial view of seed $\times 8$. N. side view of seed $\times 8$. A–N from *Halford & Cockerton Q9143* (BRI), Del. W.Smith.

21. *Beyeria similis* (Müll.Arg.) Benth., *Fl. Austral.* 6: 67 (1873); *Beyeriopsis similis* Müll. Arg., *Linnaea* 34: 58 (1865). **Type:** [Western Australia.] Swan River, [1852,] *J. Drummond ser. 6 no. 86* (holo: G-DC *n.v.* [microfiche IDC 800-73, 2454: II. 4]; iso: MEL [3 sheets 114226, 114227, 114228], PERTH, K).

Monoecious, erect, much-branched **shrubs** to 0.3 m high, resinous on most parts. Young branchlets of unknown colour, angular becoming terete with age, glabrous; older branchlets with grey to black shallowly fissured bark. **Leaves** ± sessile; blades linear, 20–35 (–50) mm long, 0.8–1.5 mm wide, length:width ratio 25–34:1; adaxial surface glabrous, tuberculate with yellow resinous dots or rarely smooth; abaxial surface hairy with ± sessile, stellate hairs *c.* 0.05 mm across; base cuneate; margins revolute usually to midrib concealing abaxial leaf surface; apex obtuse to rounded, recurved; midvein obscure adaxially, abaxially raised, ± flattened, glabrous and resinous; secondary and tertiary veins obscure; marginal glands absent. **Flowers** pedicellate, axillary, solitary or fasciculate in 2–4-flowered fascicles; bracts ± oblong, 0.5–0.7 mm long, acute at apex, glabrous; pedicels ± glabrous except for scattered minute erect simple hairs proximally, stouter and longer on female flowers than on male flowers; calyx lobes 5, of unknown colour when fresh, suborbicular, glabrous, concave adaxially, gibbose abaxially, the margins ± entire, rounded at apex; petals slightly shorter than or equal to calyx lobes, erect, suborbicular, glabrous abaxially, the margins entire; disc of 5 discrete glands in male flowers, obscure or absent in female flowers. **Male flowers** with pedicels 2–3 mm long; calyx lobes 0.9–1.4 mm long, 0.8–1.8 mm wide, surrounding androecium at anthesis; petals 0.7–0.9 mm long, 0.8–1.2 mm wide; sparsely hairy adaxially proximally; disc glands thin, triangular, < 0.2 mm long, dorsi-ventrally compressed, glabrous, acute; receptacle *c.* 0.9 mm across, glabrous; stamens 15; filaments erect, 0.4–0.6 mm long, glabrous, bifid distally; anthers *c.* 0.2 mm long. **Female flowers** with pedicels 5–10 mm long; calyx lobes ± appressed to and enclosing gynoecium apart from stigma,

0.7–1 mm long, 1.2–1.7 mm wide; petals marcescent, 0.4–0.7 mm long, 0.4–0.6 mm wide, glabrous abaxially; ovary ellipsoid, *c.* 1 mm long, glabrous, 2- or 3-locular, with 4 or 6 short subapical appendages; style ± obsolete; stigma calyptriform, *c.* 0.4 mm across, glabrous, with margins entire. **Fruits** subellipsoid, 3–6 mm long (excluding horns), 4–5.5 mm across, with 2 small horn-like subapical appendages, 1-seeded, glabrous, ± smooth; persistent calyx *c.* one fifth the length of mature fruit; subapical appendages up to 2 mm long. **Seeds** ellipsoid, 4.3–4.7 mm long (including caruncle), 3–3.5 mm across, 3–3.5 mm in thickness; testa light to dark brown; caruncle 0.5–0.8 mm long, 1–1.8 mm wide, creamy-white.

Additional specimens examined: **Western Australia.** [precise localities withheld for conservation purposes], Oct 1974, *George 12908* (BRI); Mt Peron, Aug 1949, *Gardner 9410* (PERTH); Aug 1979, *Griffin 2003* (PERTH); Sep 1976, *Johnson 3299* (BRI); Sep 1976, *Briggs 6371* (NSW).

Distribution and habitat: *Beyeria similis* is confined to the Mt Lesueur area north-east of Jurien Bay, Western Australia (**Map 23**). It grows in shrubland communities on sandstone ridges, and in heath communities with low eucalypts on sandy clay soils in valleys and on shallow grey sand among massive lateritic duricrust boulders.

Phenology: Flowers and fruits have been collected in August and September.

Affinities: *Beyeria similis* is morphologically most similar to *B. gardneri*. For distinguishing characters refer to the 'Affinities' section under *B. gardneri*.

Notes: *Beyeria similis* is listed as Priority Three under DEC Conservation Codes for Western Australian Flora (Florabase, <http://florabase.dec.wa.gov.au> [accessed June 2008]).

22. *Beyeria simplex* Halford & R.J.F.Hend. **species nova** *B. latifoliae* (Müll.Arg.) Baill. et *B. lepidopetalae* Müll.Arg. ut videtur maxime affinis sed ab utroque ramulis et petiolis indumento pilorum simplicium non stellatorum et ovariis glabris distinguenda est. A *B. latifolia* lamina folii angusto-oblonga vel angustissimo-ovata non ovata ad late ovata et pedicellis et pagina adaxiali loborum calycis glabra non pilifera nec non differt. A *B. lepidopetala* pedicellis brevioribus (2–4 mm longis non 8–30 mm longis) nec non differt. **Typus:** Western Australia. Cape Arid National Park, at foot of Mt Ragged, 5 December 1971, *R.D.Royce 10111* (holo: PERTH; iso: CANB).

Beyeria sp. B Mount Ragged (A.S.George 7422), in Florabase, <http://florabase.dec.wa.gov.au> [accessed June 2008].

Monoecious **shrubs** to *c.* 0.3 m high, not resinous. Young branchlets \pm terete, moderately to densely hairy, glabrescent with age; hairs simple, ascending to spreading, 0.4–0.9 mm long; older branchlets with grey shallowly fissured bark. **Leaves** petiolate; petioles 1–2 mm long, moderately hairy with hairs as for young branchlets; blades narrow-oblong or very narrow-ovate, 7–17 mm long, 1.7–3.5 mm wide, length:width ratio 4–5:1; adaxial surface glabrous and \pm smooth; abaxial surface densely hairy with \pm sessile, stellate hairs *c.* 0.4 mm across; base obtuse; margins revolute usually to midrib concealing abaxial leaf surface; apex rounded; midvein slightly impressed adaxially, abaxially raised, moderately hairy with simple hairs up to 0.4 mm long; secondary and tertiary veins obscure; marginal glands usually present on blade, up to 1 mm from base, 1 per side of midrib, \pm sessile, smooth, *c.* 0.1 mm across. **Flowers** pedicellate, axillary, solitary; bracts oblong, 0.1–0.8 mm long, obtuse or rounded at apex, \pm glabrous; pedicels 2–4 mm long, glabrous, stouter on female flowers than on male flowers; calyx lobes 5, of unknown colour when fresh, suborbicular, glabrous, concave adaxially, gibbose abaxially, the margins erose, obtuse to rounded at apex; petals slightly shorter than calyx lobes, erect, transverse-elliptic, glabrous abaxially, densely villose adaxially, the margins erose distally;

disc of 5 discrete glands; glands fleshy, 0.4–0.5 mm long, laterally compressed, glabrous, truncate. **Male flowers** with calyx lobes *c.* 1.4 mm long and 1.5 mm wide, surrounding androecium at anthesis; petals 0.9–1 mm long, 1.6–1.8 mm wide; receptacle *c.* 1.8 mm across, glabrous; stamens 20–25; filaments erect, 0.3–0.6 mm long, glabrous, bifid distally; anthers 0.3–0.5 mm long. **Female flowers** with calyx lobes \pm appressed to and enclosing gynoecium apart from stigma, *c.* 1.4 mm long, and 1.3 mm wide; petals marcescent, *c.* 0.8 mm long, 0.9–1 mm wide; ovary broad-ovoid, laterally compressed, *c.* 1.2 mm long, glabrous, 2-locular; style 0.1–0.2 mm long, glabrous; stigma calyptiform, *c.* 0.3 mm across, shallowly umbilicate, glabrous, with margins \pm entire. **Fruits** \pm ovoid, laterally compressed, *c.* 6 mm long, 5.3 mm across and 3.6 mm in thickness, 1- or 2-seeded, glabrous, smooth; persistent calyx *c.* one fifth the length of mature fruit. **Seeds** ellipsoid, dorsi-ventrally compressed, *c.* 5.2 mm long (including caruncle), 3.4 mm across and 2.8 mm in thickness; testa light brown; caruncle *c.* 0.6 mm long and 1 mm wide, light brown. **Fig. 9.**

Additional specimens examined: Western Australia. Mt Ragged, Jan 1966, *George 7422* (BRI, PERTH); *ibid.*, Apr 1996, *Barrett 670* (PERTH); lower western slopes of Mt Ragged, Dec 1999, *Hislop 1956B* (PERTH); western slopes of Mt Ragged, Cape Arid, Mar 1987, *Keighery & Alford 1503* (PERTH).

Distribution and habitat: *Beyeria simplex* occurs on the south coast of Western Australia where it is known from Mt Ragged in Cape Arid National Park (**Map 24**). It grows in mallee heath on mountain slopes in stony sandy soil and in gullies on rocky slopes.

Phenology: Flowers and fruits have been collected in September, October, December and March.

Affinities: *Beyeria simplex* is most similar to *B. latifolia* and *B. lepidopetala* but differs from both of these species in having an indumentum of simple rather than stellate hairs on the branchlets and petioles, and a glabrous ovary. *Beyeria simplex* further differs from *B. latifolia* in having narrow-oblong or very narrow-ovate rather than ovate to broad-ovate leaves, glabrous rather than hairy pedicels, and calyx lobes that are

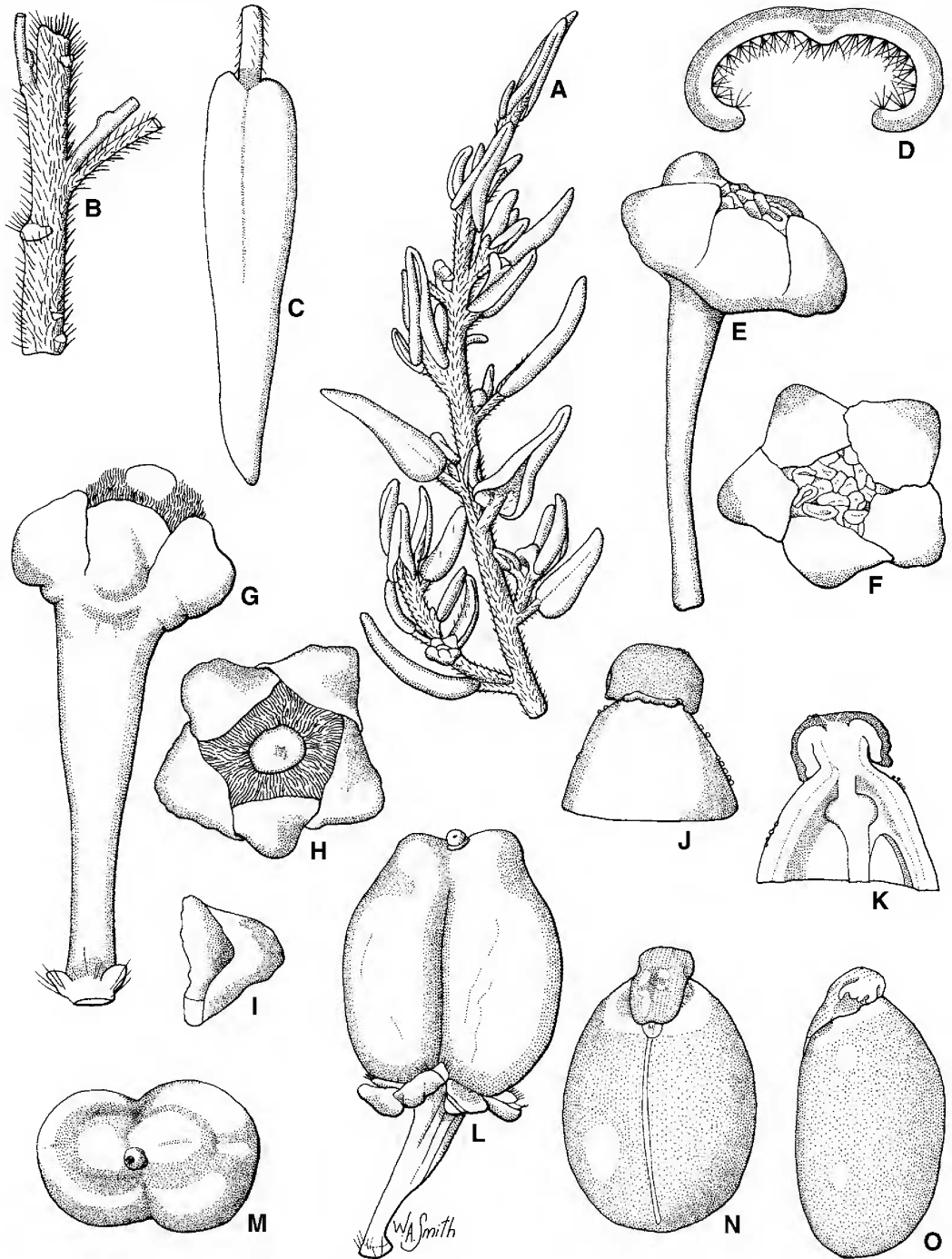


Fig. 9. *Beyeria simplex*. A. branchlet with flowers $\times 2$. B. branchlet showing indumentum $\times 8$. C. adaxial view of leaf $\times 4$. D. transverse section of leaf $\times 12$. E. side view of male flower $\times 12$. F. face view of male flower $\times 12$. G. side view of female flower $\times 12$. H. face view of female flower $\times 12$. I. side view of calyx lobe from female flower $\times 12$. J. Stigma $\times 24$. K. transverse section of stigma and distal half of ovary $\times 24$. L. side view of fruit $\times 6$. M. face view of fruit $\times 6$. N. abaxial view of seed $\times 8$. O. side view of seed $\times 8$. A from *George 7422* (BRI), B–O from *Royce 10111* (PERTH). Del. W.Smith.

glabrous on the adaxial surface rather than hairy. *Beyeria simplex* also differs from *B. lepidopetala* in having shorter pedicels which are 2–4 mm long compared with 8–30 mm long as in that species.

Etymology: The specific epithet is from Latin *simplex*, simple, undivided or unbranched, and refers to the simple hairs on the branchlets of this species.

23. *Beyeria sulcata* Halford & R.J.F.Hend. **species nova** *B. brevifoliae* (Müll.Arg.) Benth. affinis sed foliis costa excurrenti ad apicem, pedicellis robustioribus et generatim brevioribus (1–9 mm longis non 5–15 mm longis), ramulis plerumque sulcatis, foliis sessilibus vel petiolis usque ad 0.5 mm longis non petiolis semper 1–2 mm longis et surculis immaturis viscidis differt. *Beyeria sulcata* cum *B. lechenaultii* (DC.) Baill. antea confusa sed floribus ambo maribus et femineis petalis, calycis lobis florum marium plus minusve erectis et androecium sub anthesi cingentibus facile distinguenda. **Typus:** Western Australia. *c.* 13 km NE of Bruce Rock on road to Merredin, 16 September 1988, *R.J.F.Henderson H3161* (holo: BRI; iso: K, MEL, PERTH, distribuendi).

Monoecious, erect to spreading **shrubs** to 2 m high, usually resinous on most parts. Young branchlets of unknown colour when fresh, ± angular, mostly longitudinally grooved, glabrous; older branchlets with grey to black flaking or shallowly fissured bark. **Leaves** sessile or shortly petiolate; petioles up to 1.7 mm long, glabrous, minutely papillose (usually obscured by resinous covering); blades narrow-obovate or linear, 7–35 mm long, 0.8–2.2 mm wide, length:width ratio 8–35:1; adaxial surface glabrous, minutely papillose (usually obscured by resinous covering); abaxial surface glabrous and papillose or densely hairy with sessile, stellate hairs up to 0.3 mm across; base cuneate to attenuate; margins recurved usually to midrib concealing abaxial leaf surface; apex rounded, obtuse, acute to attenuate or truncate, ultimately apiculate with extension from midrib; apiculum stout, up to 0.3 mm long, bent upward; midvein slightly raised adaxially, abaxially prominently raised, ± flattened and glabrous; secondary and tertiary veins obscure; marginal glands

absent or present on blade, up to 10 mm from base, 1 or 2 per side, sessile, smooth, up to 0.2 mm across. **Flowers** pedicellate, axillary, solitary or fasciculate in 2- or 3-flowered fascicles; bracts ovate, 0.3–0.7 mm long, acute to obtuse at apex, glabrous; pedicels glabrous, slightly stouter on female flowers than on male flowers; calyx 5, of unknown colour when fresh, concavo-convex, glabrous, the margins entire or erose, marginal glands usually present, rounded to truncate at apex; petals slightly shorter than or equal to calyx, suborbicular, erect, the margins erose; disc in male flowers of 5 discrete glands, female flowers absent or obscure. **Male flowers** with pedicels 0.8–3.5 mm long; calyx lobes broad-obovate or broad-oblong, 0.8–1 mm long, 0.6–0.9 mm wide, surrounding androecium at anthesis; petals 0.6–1 mm long, 0.5–1 mm wide, glabrous abaxially, sparsely villose adaxially proximally; disc glands fleshy, filiform, up to 0.2 mm long, glabrous; receptacle *c.* 0.9 mm across, sparsely stellate hairy; stamens 7–11; filaments erect, 0.1–0.3 mm long, glabrous, shortly bifid distally; anthers 0.3–0.4 mm long. **Female flowers** with pedicels 0.7–7.5 mm long; calyx lobes ± appressed and enclosing gynoecium apart from stigma, broad-oblong or broad-obovate, 0.8–1.3 mm long, 0.4–0.9 mm wide; petals marcescent, 0.5–0.8 mm long, 0.4–0.7 mm wide, glabrous; ovary ovoid and laterally compressed or subglobose, 0.8–1.3 mm long, glabrous, 2- or 3-locular; style ± obsolete; stigma calyptriform, 0.5–0.7 mm across, sulcate adaxially, glabrous, with margins entire. **Fruits** obloid or broad-ovoid, 2.7–4.7 mm long, 2.4–3.8 mm across, 2- or 3-seeded, glabrous, ± smooth; persistent calyx up to one third the length of mature fruit. **Seeds** obloid or ellipsoid, dorsi-ventrally compressed, 2.7–4.2 mm long (including caruncle), 1.6–2.2 mm across, 1.5–2 mm in thickness; testa dark brown; caruncle 0.9–1 mm long, *c.* 0.8 mm wide, light brown.

Distribution: *Beyeria sulcata* is endemic to south-western Western Australia.

Affinities: *Beyeria sulcata* is similar to *B. brevifolia* but differs in having leaves with the midrib excurrent at the apex, pedicels which are more robust and generally shorter (1–9 mm long compared with 5–15 mm long),

mostly sulcate branchlets, leaves which are sessile or with a petiole up to 0.5 mm long (compared with leaves with petioles 1–2 mm long), and its generally viscid young shoots compared with non-viscid shoots.

Beyeria sulcata has in the past been confused with *B. lechenaultii* (DC.) Baill. but is easily distinguished in having petals in both male and female flowers and with the calyx lobes of male flowers more or less erect and surrounding the androecium at anthesis.

Etymology: The specific epithet is from Latin *sulcatus*, furrowed or grooved, and refers to the longitudinal grooves on the branchlets of this species.

Notes: *Beyeria sulcata* exhibits some discontinuous variation in minor leaf and stem characters with little geographical discontinuity. This variation is considered sufficient to warrant formal recognition of four varieties within this species which can be distinguished using the following key.

-
- 1 Leaf apices with a truncate apiculum **23d. *B. sulcata* var. *truncata***
 - 1. Leaf apices with an acute apiculum 2
 - 2 Young branchlets not distinctly grooved; pedicels 2–9 mm long; leaf apices acute to attenuate **23c. *B. sulcata* var. *gracilis***
 - 2. Young branchlets distinctly longitudinally grooved; pedicels 1–4 mm long; leaf apices rounded to obtuse 3
 - 3 Leaf blades linear, 0.8–1.1 mm wide **23b. *B. sulcata* var. *brevipes***
 - 3. Leaf blades narrow-obovate, 1.3–2.5 mm wide **23a. *B. sulcata* var. *sulcata***

23a. *Beyeria sulcata* Halford & R.J.F.Hend. var. *sulcata*

Beyeria brevifolia var. *robustior* Airy Shaw, *Kew Bull.* 26: 69 (1971). **Type:** Western Australia. Merredin, 28 November 1923, *M.Koch R2996* (holo: K [2 sheets]; ?iso: PERTH; MEL [3 sheets]; NSW).

Bark on lower stems ± smooth, shiny, bronze-coloured, with peeling, reddish coloured papery strips. Young branchlets distinctly longitudinally grooved. **Leaves** sessile or with petioles up to 0.7 mm long; blades narrow-obovate, 7–16 (–23) mm long, 1.3–2.5 mm wide, apex rounded or obtuse, ultimately apiculate with extension from midrib; apiculum stout, up to 0.2 mm long. **Male flowers** with pedicels 1.2–1.7 mm long. **Female flowers** with pedicels 0.7–1.5 (–3) mm long; ovary 2- or 3-locular. **Fig. 10 & 11a–d.**

Additional selected specimens examined: Western Australia. Bronti [Brontie], Aug 1953, *Gardner 12186* (PERTH); along State Vermin Fence No. 7, 60 km NNW of Southern Cross, Nov 1985, *Dodd 222* (CANB, PERTH); Coolgardie, Oct 1934, *Gardner s.n.* (PERTH); Calooli, 9 miles [c. 14 km] SW of Coolgardie, Jul 1925, *Franks s.n.* (PERTH); Queen Victoria Springs N.R. study area, Jun 1987, *Pearson 229* (PERTH); Queen

Victoria Spring, N of Zanthus, Oct 1956, *Royce 5523* (PERTH); between Cundeelee and Queen Victoria Spring, Oct 1956, *Royce 5516* (PERTH); 12 miles [c. 19 km] S of Queen Victoria Spring, Jan 1956, *Royce 5327* (PERTH); near Campion, Aug 1945, *Gardner s.n.* (PERTH); Campion, Sep 1945, *Gardner 7635* (PERTH); Booraan [Booran], Aug 1950, *Gardner 9540* (MEL, PERTH); Southern Cross, Aug 1974, *Wittwer 1291* (PERTH); 13 km E of Southern Cross, Mar 1966, *Wilson 4038* (PERTH); 11 miles [c. 18 km] E of Southern Cross, Oct 1963, *Jefferies 631006* (PERTH); Karalee, Mar 1957, *Jefferies 573074* (PERTH); c. 27 km ESE of Southern Cross, on road to Coolgardie, Sep 1988, *Henderson H3162* (BRI); 13 km NE of Mt Hampton, c. 50 km SSW of Southern Cross, Sep 1979, *Newbey 5849* (PERTH); 28 miles [c. 45 km] S of Coolgardie, on Norseman road, Sep 1965, *Beaublehole ACB13305* (NSW, PERTH); 11 miles [c. 18 km] from Lake Grace on Ravensthorpe road, Oct 1965, *Knox 65XO22* (PERTH); No. 1 Rabbit Proof Fence, c. 32 km E of Lake King Township, Aug 1968, *Wilson 6969* (PERTH).

Distribution and habitat: *Beyeria sulcata* var. *sulcata* occurs in southern Western Australia in an area more or less bounded by Kularin in the west, eastward to Queen Victoria Spring on the southern edge of the Great Victoria Desert and southwards to Frank Hann National Park and Lake Grace (**Map 25**). It grows in open woodland or hummock grassland communities on mostly sandy soils.

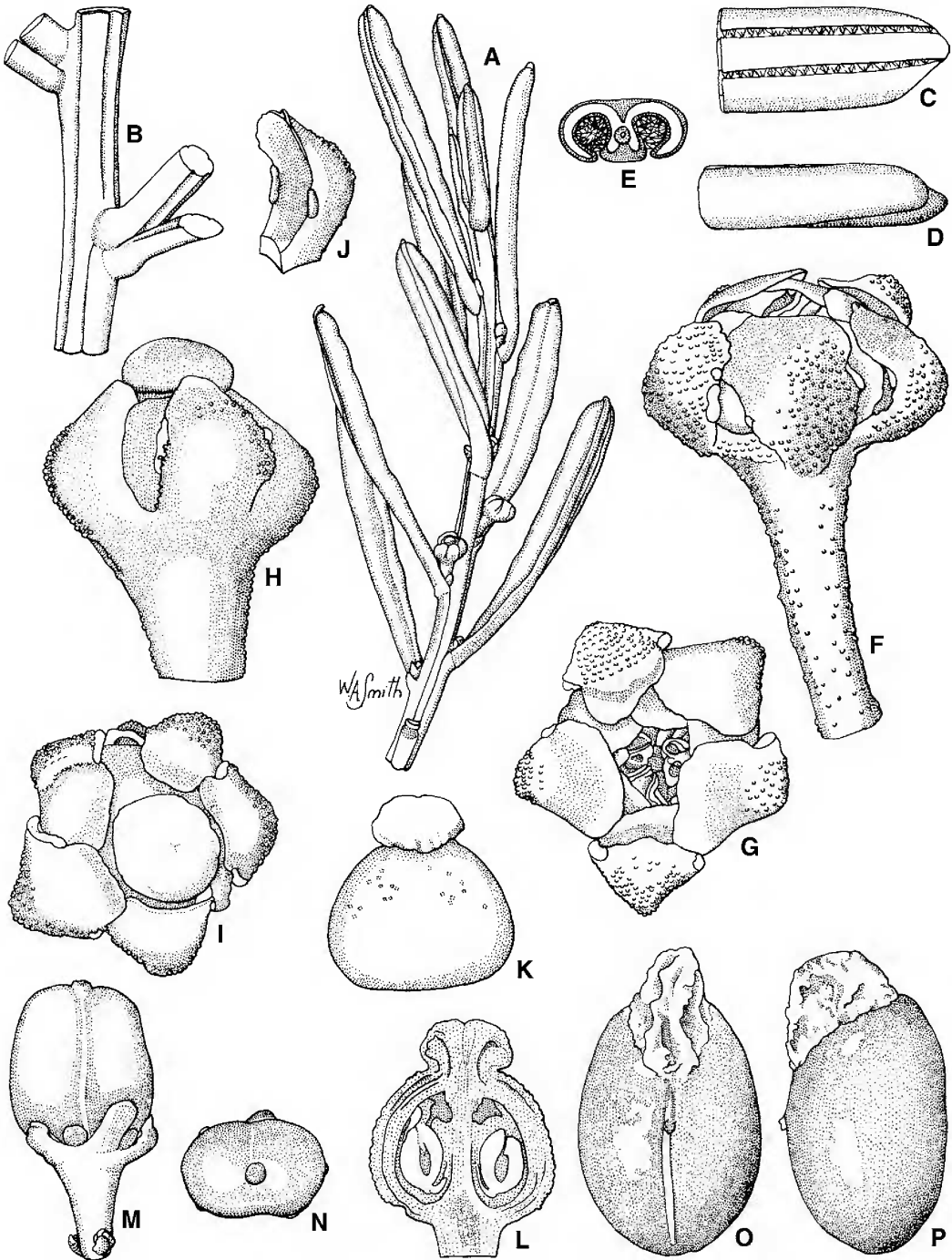


Fig. 10. *Beyeria sulcata* var. *sulcata*. A. branchlet with flowers $\times 3$. B. branchlet showing longitudinal grooves $\times 6$. C. abaxial view of leaf apex $\times 12$. D. side view of leaf apex $\times 12$. E. transverse section of leaf $\times 12$. F. side view of male flower $\times 24$. G. face view of male flower $\times 24$. H. side view of female flower $\times 24$. I. face view of female flower $\times 24$. J. side view of calyx lobe from female flower $\times 24$. K. side view of ovary and style $\times 24$. L. transverse section of stigma and ovary $\times 24$. M. side view of fruit $\times 6$. N. face view of fruit $\times 6$. O. abaxial view of seed $\times 12$. P. side view of seed $\times 12$. A–P from *Henderson H3161* (BRI). Del. W.Smith.

Phenology: Flowers have been collected throughout the year, particularly from August to November, fruits in February, March and from June to November.

23b. *Beyeria sulcata* var. *brevipes* (Airy Shaw) Halford & R.J.F.Hend. **combinatio nova**

Basionym: *Beyeria brevifolia* var. *brevipes* Airy Shaw, *Kew Bull.* 26: 69 (1971). **Type:** Western Australia. 370 mile peg, Coolgardie – Norseman road, May 1964, *P.R.Jefferies 640515* (holo: K; iso: PERTH).

Bark on lower stems unknown. Young branchlets longitudinally grooved. **Leaves** sessile or with petioles up to 0.7 mm long; blades linear, 15–22 mm long, 0.8–1.1 mm wide, apex rounded or obtuse, ultimately apiculate with extension from midrib; apiculum stout, up to 0.3 mm long. **Male flowers** with pedicels 1–3 mm long. **Female flowers** with pedicels 1.5–4 mm long; ovary 2- or 3-locular. **Fig. 11e–h.**

Additional selected specimens examined: Western Australia. c. 44 km SE of Coolgardie, on road to Norseman, Sep 1988, *Henderson H3171* (BRI); 27 miles [c. 43 km] southward from Coolgardie, Mar 1953, *Gardner 11141* (PERTH); N of Norseman, *White s.n.* (PERTH); *ibid.*, *s.dat.*, *White 611008* (PERTH); just north of Norseman, Mar 1957, *Jefferies 573059* (PERTH); 34 km E of Sinclair Soak, c. 93 km NE of Norseman, Aug 1980, *Newbey 7083* (PERTH); North Ironcap, May 1978, *Keighery 1676* (PERTH); near south end of Lake Cowan, c. 5 km N of Norseman, Jul 1967, *Wilson 6052* (PERTH); c. 30 km SSW of Norseman, on road to Salmon Gums, Sep 1988, *Henderson H3174* (BRI); c. 40 km SSE of Norseman, on road to Salmon Gums, Aug 1988, *Henderson H3176* (BRI).

Distribution and habitat: *Beyeria sulcata* var. *brevipes* is known from south-western Western Australia in an area more or less bounded by Southern Cross, Coolgardie and Salmon Gums (**Map 26**). It is recorded as growing on well-drained sandy soils sometimes with gravel in mallee communities.

Phenology: Flowers have been collected in March, May and from July to November, fruits in May, July and from September to November.

Affinities: *Beyeria sulcata* var. *brevipes* differs from *B. sulcata* var. *sulcata* by its generally narrower and linear leaf blades.

23c. *Beyeria sulcata* var. *gracilis* Halford & R.J.F.Hend. **varietas nova** foliorum lamina acuta usque attenuata apiculo usque ad 0.2 mm longum, petiolis et pedicellis plerumque longioribus et ramulis juvenibus non distincte longitudinaliter sulcatis a varietatibus omnibus ceteris *Beyeriae sulcatae* differt. **Typus:** Western Australia. 74 km W of Kumarl, c. 122 km N of Esperance, 10 October 1966, *P.G.Wilson 5715* (holo: PERTH).

Beyeria sp. C South West (A.S.George 9878), in Florabase, <http://florabase.dec.wa.gov.au> [accessed June 2008].

Bark on lower stems shallowly fissured, persistent, dull, grey, rough. Young branchlets not distinctly longitudinally grooved. **Leaves** with petioles 1–1.7 mm long; blades ± linear, 15–35 mm long, 0.9–1.5 mm wide, with the apex acute to attenuate, ultimately terminated with an apiculate extension from midrib; apiculum stout, up to 0.2 mm long. **Male flowers** with pedicels 2–3.5 mm long. **Female flowers** with pedicels 2–9 mm long; ovary 2- or 3-locular. **Fig. 11i–l.**

Additional selected specimens examined: Western Australia. Hi Vallee Property, Warradarge, towards NW corner of Butte, Jul 2001, *Hislop & Hort MH2253* (BRI); SW of Norseman, Oct 1961, *White 611015* (PERTH); 3 km ENE of Salmon Gums, Mar 1980, *Newbey 6671* (PERTH); Newdegate Research Station, 14 km W of Newdegate, Aug 1968, *Wilson 7031* (PERTH); near 260 mile post between Lake Grace and Lake King, Oct 1963, *Jefferies 631020* (PERTH); 25 km W of Lake Grace, Sep 1967, *Wilson 6212* (PERTH); Dunn Rock N.R., 30 km SW of Lake King, Apr 1984, *Backshall DJB87* (PERTH); c. 10 km SW [of] Lake Lockhart near access road, Oct 1982, *Coates AC25* (PERTH); near junction of West and Phillips Rivers, S of Ravensthorpe, Nov 1965, *George 7179* (PERTH); 56 miles [c. 90 km] W of the junction of Norseman – Esperance and Lake King roads, May 1964, *Jefferies 640512* (PERTH); 31 km due ENE of Muckinwobert Rock, 1 km NE of Melaleuca road on West Point road, Sep 1984, *Burgman 3995* (PERTH); 14 km E of Grass Patch on Steddy's road, May 1982, *van der Moezel PGV70* (PERTH); Esperance, May 1974, *Edmiston E717* (PERTH); 25.5 km NE of Mt Ridley, May 1990, *Archer 12059014* (MEL); 24 km NW of Clyde Hill, May 1983, *Burgman & McNee 1210* (PERTH).

Distribution and habitat: *Beyeria sulcata* var. *gracilis* is confined to south-western Western Australia where it occurs from near Kondinin eastwards to Clyde Hill, north north east of Esperance, with a disjunct population near Eneabba (**Map 27**). It grows in open shrub mallee or heath communities on well-drained sandy soils sometimes with gravel.

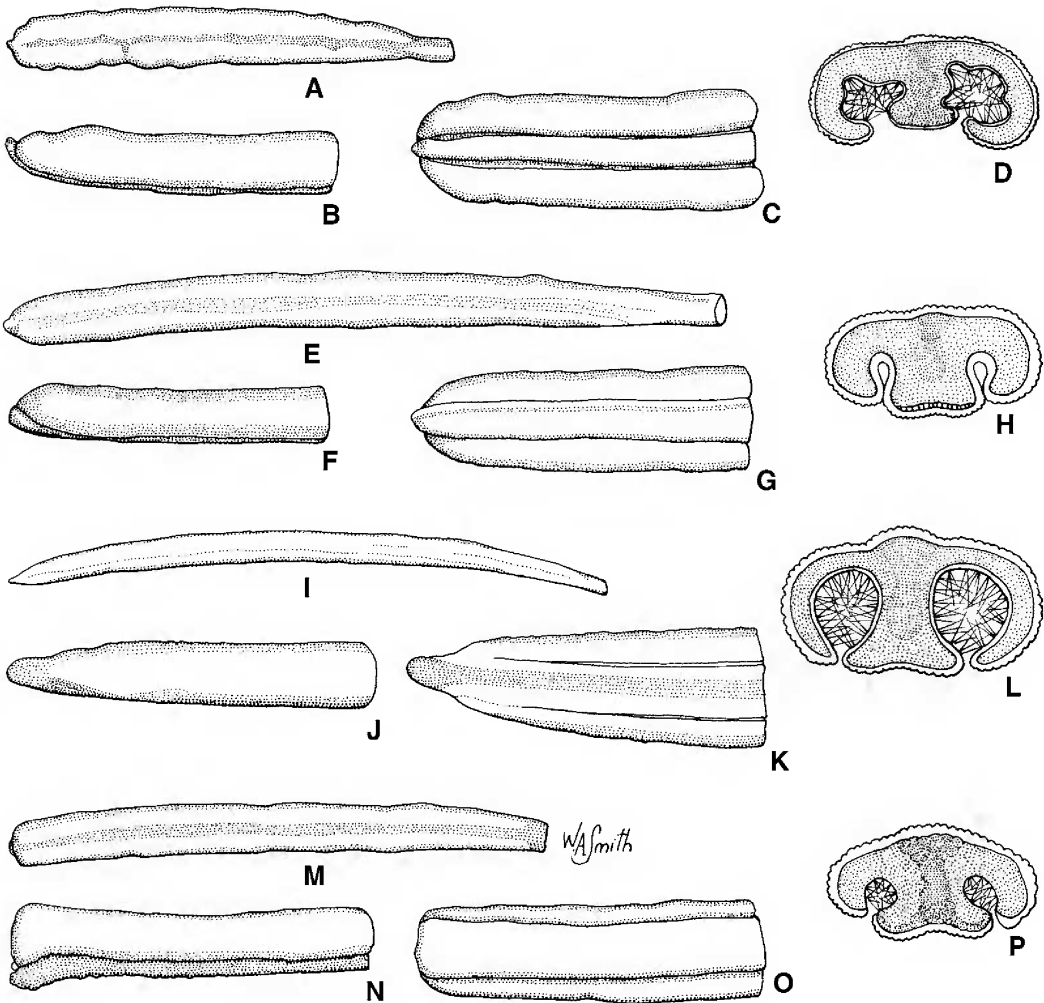


Fig. 11. Leaf shape of *Beyeria sulcata* varieties. *B. sulcata* var. *sulcata*. A. abaxial view of leaf $\times 3$. B. side view of leaf apex $\times 6$. C. abaxial view of leaf apex $\times 6$. D. transverse section of leaf $\times 12$. *B. sulcata* var. *brevipes*. E. abaxial view of leaf $\times 6$. F. side view of leaf apex $\times 12$. G. abaxial view of leaf apex $\times 12$. H. transverse section of leaf $\times 24$. *B. sulcata* var. *gracilis*. I. abaxial view of leaf $\times 3$. J. side view of leaf apex $\times 12$. K. abaxial view of leaf apex $\times 12$. L. transverse section of leaf $\times 24$. *B. sulcata* var. *truncata*. M. abaxial view of leaf $\times 6$. N. side view of leaf apex $\times 12$. O. abaxial view of leaf apex $\times 12$. P. transverse section of leaf $\times 24$. A–D from *Pearson 229* (PERTH); E–H from *Jefferies 640515* (PERTH); I–L from *Wilson 5715* (PERTH); M–P from *White 611017* (PERTH). Del. W. Smith.

Phenology: Flowers have been collected from March to November, fruits in May, June and from August to October.

Affinities: *Beyeria sulcata* var. *gracilis* differs from the other varieties of *Beyeria sulcata* in having an acute to attenuate leaf blade apex with an apiculum up to 0.2 mm long, generally longer petioles and pedicels, and its young branchlets not being distinctly longitudinally grooved.

Etymology: The specific epithet is from Latin *gracilis*, thin or slender, and refers to the generally narrower leaves of this variety compared with those of *B. sulcata* var. *sulcata*.

23d. *Beyeria sulcata* var. *truncata* (Airy Shaw) Halford & R.J.F.Hend. **combinatio nova**

Basionym: *Beyeria brevifolia* var. *truncata* Airy Shaw, *Kew Bull.* 26: 69 (1971). **Type:** Western Australia. 92 miles [c. 147 km] from Lake King turnoff from Coolgardie – Esperance road, October 1963, *P.R.Jefferies 631019* (holo: PERTH; iso: PERTH).

Bark on lower stems unknown. Young branchlets longitudinally grooved. **Leaves** sessile or with petioles up to 0.7 mm long; blades linear, 10–13 mm long, 0.8–1.2 mm wide, apex rounded to truncate, ultimately apiculate with truncate extension from midrib. **Male flowers** with pedicels 0.8–1.3 mm long. **Female flowers** with pedicels c. 2.4 mm long; ovary 2-locular. **Fig. 11m–p.**

Additional specimens examined: Western Australia. 92 miles [c. 148 km] W of Norseman – Esperance road along Lake King road, May 1964, *Jefferies 640514* (PERTH); 34 miles [c. 55 km] N of Ravensthorpe, Oct 1965, *Knox 65X034M* (PERTH); SW of Norseman, *s.d.*, *White 611017* (PERTH).

Distribution and habitat: *Beyeria sulcata* var. *truncata* is known from a small area east of Lake King, south-western Western Australia (**Map 28**). It grows on gravelly sand.

Phenology: Flowers have been collected in May and October, fruits in October.

Affinities: *Beyeria sulcata* var. *truncata* differs from other varieties of *B. sulcata* by its much more prominent midrib on the lower surface of leaf blades and the truncate leaf apex rather than an apiculate excurrent midrib. It also differs from *B. sulcata* var. *sulcata* and *B. sulcata* var. *gracilis* by its narrower leaf blades.

24. *Beyeria villosa* Halford & R.J.F.Hend. **species nova** a speciebus omnibus ceteris *Beyeriae* floribus plus minusve sessilibus et comparate parvis et ramulis juvenibus indumento villosa facile distinguibilis est. **Typus:** Western Australia. Ravensthorpe Range [precise locality withheld for conservation purposes], 25 October 1987, *K.Newbey 11802* (holo: PERTH; iso: BRI).

Beyeria sp. A Ravensthorpe (A.S.George 9474), in Florabase, <http://florabase.dec.wa.gov.au> [accessed June 2008].

Monoecious, erect and spreading, much-branched **shrubs** to 1.5 m high, resinous on calyx lobes and adaxial leaf surface. Young branchlets of unknown colour when fresh, ± angular soon becoming terete, densely hairy with simple and bifid hairs up to 0.7 mm long, glabrescent with age; older branchlets with grey to black shallowly fissured bark. **Leaves** petiolate; petioles 0.9–1.8 mm long, densely hairy with hairs as for young branchlets; blades narrow-oblong to linear, 7–14 mm long, 1.4–2.1 mm wide, length:width ratio 5–7:1, slightly recurved distally; adaxial surface almost glabrous except for scattered simple hairs, ± smooth, thickly resinous; abaxial surface densely hairy with ± sessile, stellate hairs c. 0.5 mm across; base abruptly cuneate; margins revolute to midrib concealing abaxial leaf surface; apex rounded to slightly truncate; midvein slightly impressed adaxially, abaxially raised, densely hairy with hairs as for abaxial leaf surface; secondary and tertiary veins obscure; marginal glands absent. **Flowers** ± sessile, axillary, solitary or fasciculate in 2- or 3-flowered fascicles; bracts narrow-ovate, 0.8–1.1 mm long, acute at apex, densely hairy with simple appressed hairs up to 0.6 mm long; calyx lobes 5, of unknown colour when fresh, hairy adaxially proximally, glabrous adaxially, concavo-convex, the margins entire or erose, rounded at apex; petals slightly shorter than or equal to calyx lobes, erect, glabrous abaxially and adaxially, the margins entire or erose distally; disc of 5 discrete glands; glands fleshy, ± terete, 0.2–0.3 mm long, glabrous. **Male flowers** with calyx lobes very broad-ovate, c. 0.6 mm long and 0.5 mm wide, surrounding androecium at anthesis; petals broad-elliptic, c. 0.6 mm long and 0.5 mm wide; receptacle c. 0.6 mm across, glabrous; stamens 10; filaments erect, 0.3–0.4 mm long, glabrous, bifid distally; anthers 0.2–0.3 mm long. **Female flowers** with calyx lobes ± appressed to and enclosing gynoecium apart from stigma, oblong or broad-ovate, c. 0.5 mm long and 0.3 mm wide; petals marcescent, obovate, c. 0.6 mm long and 0.5 mm wide; ovary subglobose, laterally compressed, c. 1 mm long, densely hairy, 2-locular; style 0.2–0.4 mm long, pubescent proximally; stigma discoid, c. 0.4 mm long, shallowly umbilicate, glabrous, with margins

entire, recurved. **Fruits** subglobose or obpyriform, 3–5 mm long, 2.3–4 mm across, 1-seeded, sparsely to moderately hairy; persistent calyx *c.* one quarter the length of mature fruit. **Seeds** ellipsoid, 3–4 mm long (including caruncle), 2–3 mm across; testa brown to black; caruncle 1–1.3 mm long, *c.* 1 mm wide, light brown. **Fig. 12.**

Additional specimens examined: Western Australia. [precise localities withheld for conservation purposes] Feb 2005, *Craig 6248* (PERTH); Apr 2004, *Craig 6084* (PERTH); Feb 1998, *Craig 3626* (PERTH); May 2004, *Craig 6093* (PERTH); Dec 2004, *Mappin 10535* (PERTH); Aug 1969, *George 9474* (BRI, PERTH).

Distribution and habitat: *Beyeria villosa* occurs near Ravensthorpe in south-western Western Australia (**Map 29**). It grows in mallee or tall shrubland communities often with *Eucalyptus indurata* and *Melaleuca pauperiflora* on well-drained, calcareous grey to brown clayey soils.

Phenology: Flowers have been collected in August and October, fruits in October.

Affinities: *Beyeria villosa* is not easily confused with any other species of *Beyeria*. It can be distinguished by its comparatively small, ± sessile flowers and the villose indumentum on its young branchlets.

Notes: *Beyeria villosa* is listed as Priority Four under DEC Conservation Codes for Western Australian Flora, under the name *Beyeria* sp. A Ravensthorpe (A.S.George 9474) (Florabase, <http://florabase.dec.wa.gov.au> [accessed June 2008]).

Etymology: The specific epithet is from Latin *villosus*, shaggy hairy, and refers to the indumentum on the young branchlets of this species.

Excluded and doubtful names

Beyeria bickertonensis Specht, *Rec. American-Australian Sci. Exped. Arnhem Land* 3: 249, fig. 8 (1958) = *Shonia bickertonensis* (Specht) Halford & R.J.F.Hend., *fide* Halford & Henderson (2005).

Beyeria lasiocarpa forma *denudata* Baill., *Adansonia* 6: 307 (1866), ('*denudatum*'). **Type:** [Australia.] New England, [*s. dat.*,] *C.Stuart s.n.* (herb. F.Muell.) (holo: ?MEL,

n.v.) [= possibly *Beyeria lasiocarpa* Müll. Arg.].

Beyeria loranthoides Baill., *Ètude Euphorb.* 403 (1858). **Type:** [Australia. Tasmania or Port Essington,] *s. dat.*, *Leguille* [*Guillou*] (holo: ?P *n.v.*) [= *Tasmannia* sp.? (Winteraceae)].

Baillon (1858), in the protologue of *B. loranthoides*, indicated some taxonomic doubt as to whether or not this species belonged in the genus *Beyeria*. Müller (1866) noted that Baillon had personally communicated to him that this species was probably better placed in *Drimys* (Winteraceae).

Beyeria opaca var. *longifolia* Gruning in A.Engler, *Pflanzenr.* H58: 69 (1913). **Type:** [Queensland.] Brisbane, *s. dat.*, *anon. per F.M.Bailey s.n.* (holo: B?) [= possibly *Beyeria lasiocarpa* Müll. Arg.].

Beyeria tristigma F.Muell., *Fragm.* 6: 181 (1868) [= *Shonia tristigma* (F.Muell.) Halford & R.J.F.Hend., *fide* Halford & Henderson (2005)].

Beyeria uncinata F.Muell. ex Baill., *Adansonia* 6: 306 (1866) [= *Eremophila sturtii* R.Br., *fide* Davies (1987)].

Beyeria virgata Ewart, *Proc. Roy. Soc. Victoria* n.s. 33: 226–227 (1921) [= *Bertya virgata* (Ewart) Halford & R.J.F.Hend., *fide* Halford & Henderson (2002)].

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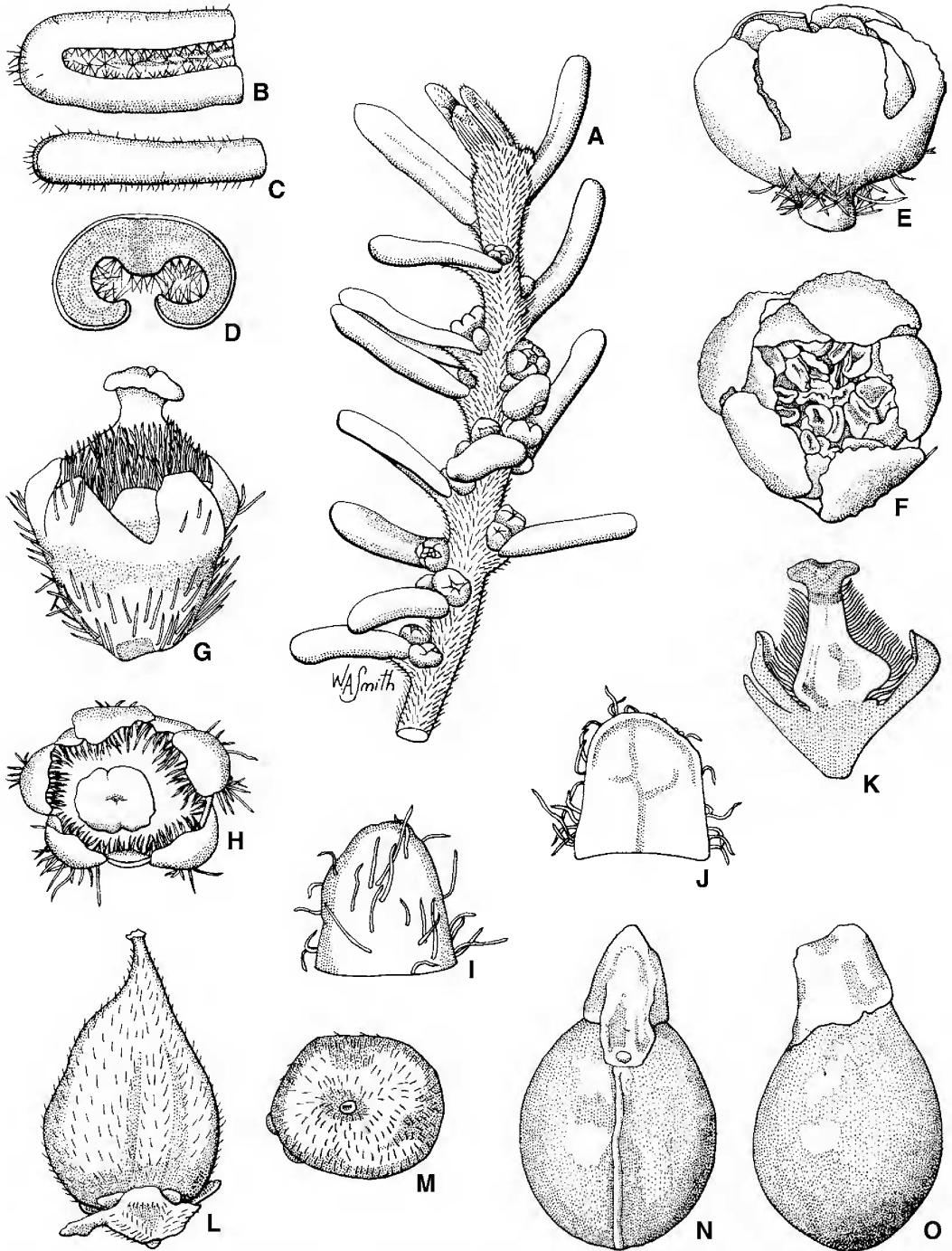


Fig. 12. *Beyeria villosa*. A. branchlet with male and female flowers $\times 4$. B. abaxial view of leaf apex $\times 12$. C. side view of leaf apex $\times 12$. D. transverse section of leaf $\times 12$. E. side view of male flower $\times 24$. F. face view of male flower $\times 24$. G. side view of female flower $\times 16$. H. face view of female flower $\times 16$. I. abaxial view of calyx lobe from female flower $\times 24$. J. adaxial view of calyx lobe from female flower $\times 24$. K. transverse section of stigma and ovary $\times 12$. L. side view of fruit $\times 4$. M. face view of fruit $\times 4$. N. abaxial view of seed $\times 12$. O. side view of seed $\times 12$. A–O from *Newby 11802* (BRI). Del. W.Smith.

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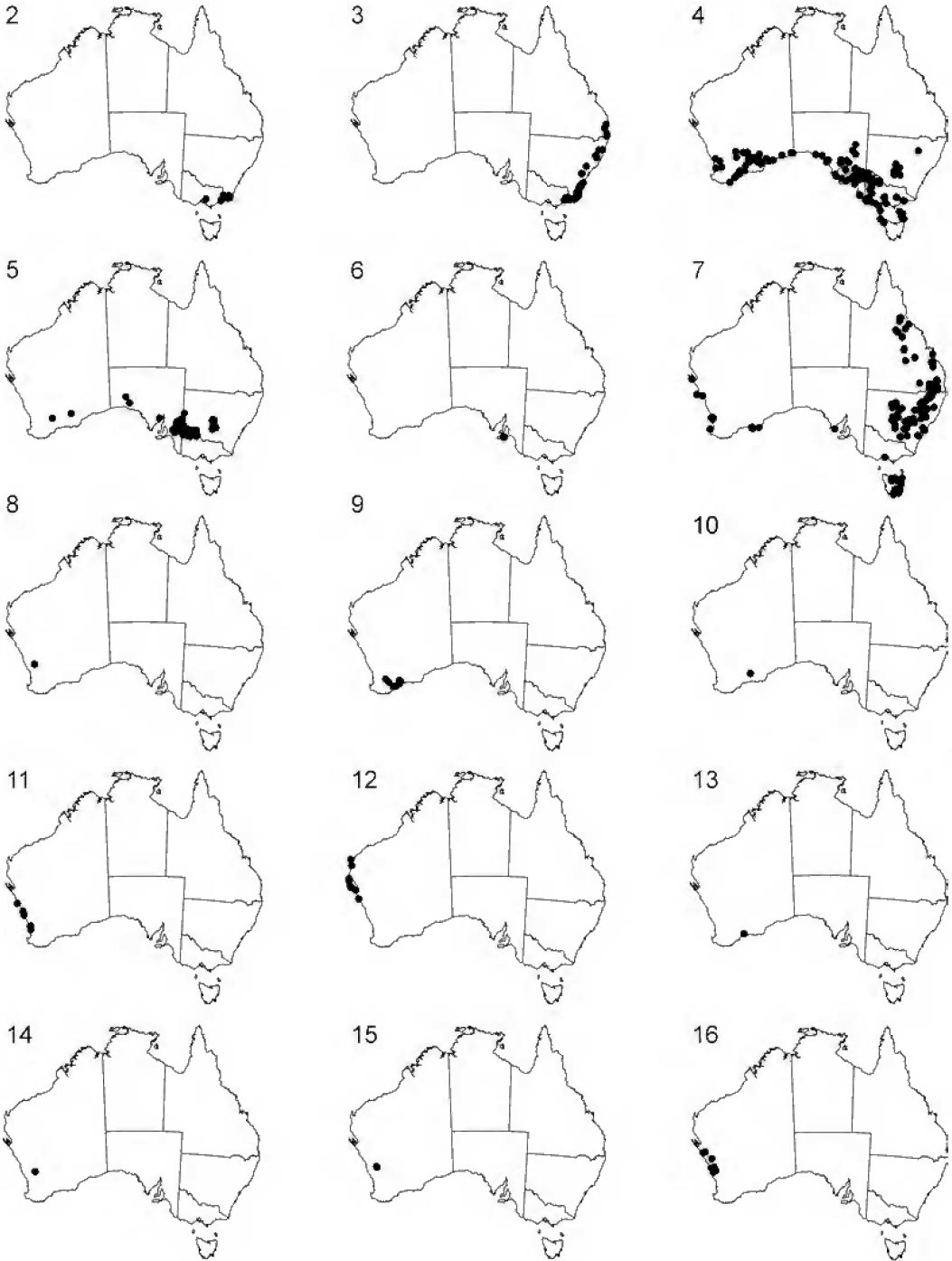
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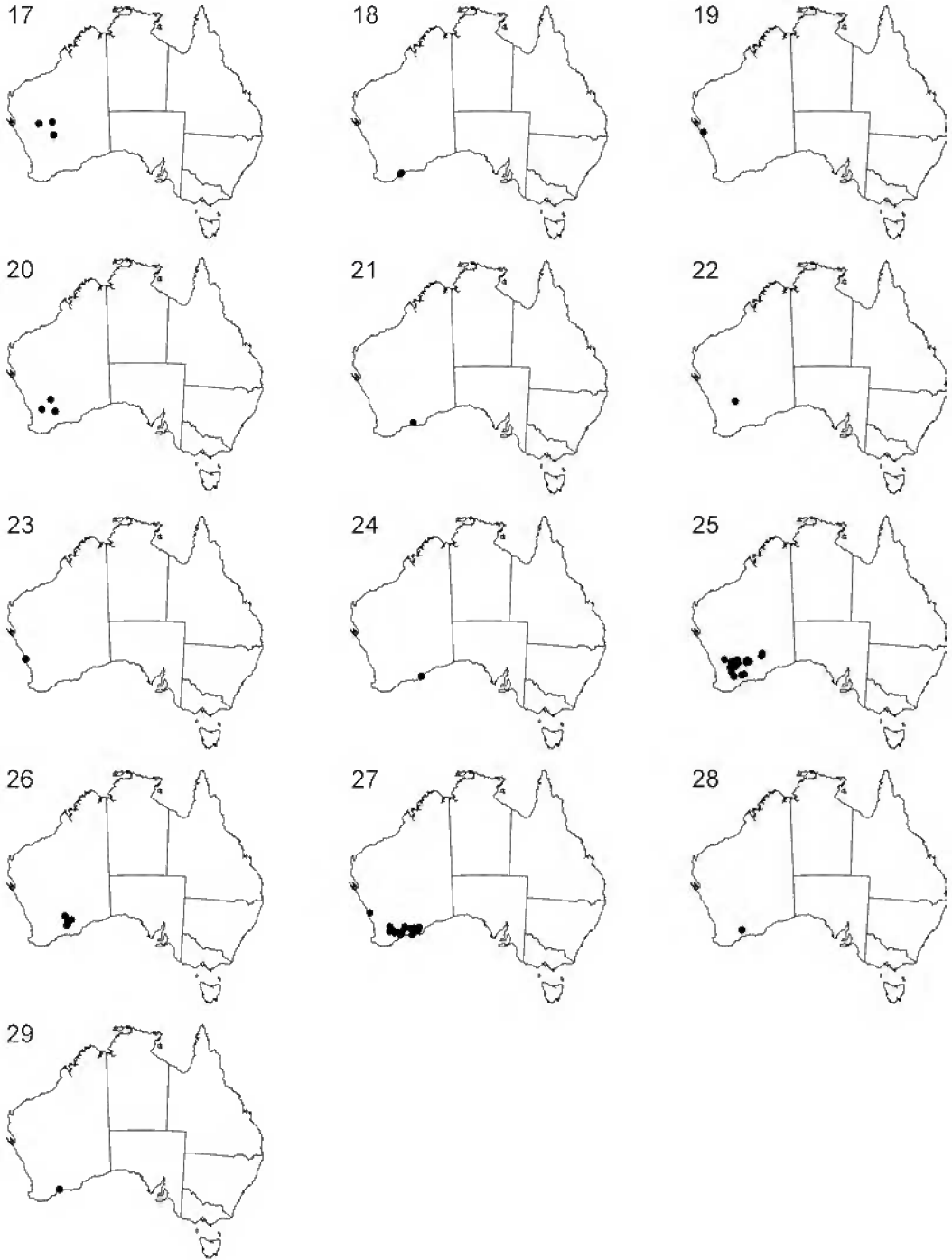
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